ENVIRONMENTAL ASSESSMENT

FOR THE

JOINT RED FLAG '05 ADA ACTIVITIES NELLIS AIR FORCE BASE

Prepared for:

FORSCOM
U.S. Army Forces Command
Fort McPherson, Georgia

Prepared by:

U.S. Army Corps of Engineers
Los Angeles District

March 2005

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
MAR 2005		**00-00-2005 to 00-00-2005**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Environmental Assessment for the Joint Red Flag '05 ADA Activities Nellis Air Force Base	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **U.S. Army Corps of Engineers,Los Angeles District,PO Box 532711,Los Angeles,CA,90053**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**208**	

DECISION RECORD AND
FINDING OF NO SIGNIFICANT IMPACT (DR/FONSI)
JOINT RED FLAG –'05 ADA ACTIVITIES

Decision: I have reviewed the Environmental Assessment (EA) for the Joint Red Flag '05 Exercise. The site-specific analysis for the proposed action is technically adequate and addresses the critical elements of the human environment. I concur with the analysis. I select the proposed action as my decision, which is for the proposed participation of one of the United States Army's Air Defense Artillery (ADA) battalions in a military training exercise to be conducted on Bureau of Land Management Lands (BLM) under airspace controlled by Nellis Air Force Base (NAFB) in Lincoln County, Nevada. The EA is incorporated into this document by reference. Preparation of the EA complies with the National Environmental Policy Act (NEPA) (42 U.S. Code [USC] § 4321 et seq.), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR 1500–1508]); Department of the Army Environmental Analysis of Army Actions (32 CFR 651); Department of the Air Force Environmental Impact Analysis Process (EIAP) (CFR 32 989) Instruction 32-7061, implements NEPA and CEQ regulations for Air Force Actions; and BLM 43 CFR 100, Planning Regulations (Instruction Memorandum [IM] 2001-03). The proposed action has incorporated appropriate components into the project description and developed Standard Operating Procedures (SOP's) and monitoring requirements to minimize potential environmental impacts. The project will be constructed under the following applicable SOP's:

- No tracked vehicles will be used.
- No earthen berms or foxholes will be constructed.
- No live or blank ammunition, or munitions simulators will be used.
- The chain of command (i.e. U.S. Army) is responsible for each Avenger, Patriot, and Sentinel unit to ensure safety and environmental requirements/restrictions are being observed. The chain of command will approve each relocation by Avenger and Sentinel units, document any environmental violation, and coordinate with the U.S. Army and the BLM if reclamation is required upon completion of the ADA activities.
- U.S. Army ground-based units will use GPS to ensure they are located within proposed site boundaries. Proposed Patriot Battery bivouac areas will be clearly delineated on maps.
- The U.S. Army will ensure that vehicle engine idling shall be limited to the extent feasible.
- To the extent feasible, the U.S. Army will ensure that vehicle speeds will remain below 20 mph on dirt roads to minimize dust and desert tortoise impacts.
- The U.S. Army will not dig at field sites. Vegetation will not be cleared at these sites. Outriggers will be installed to stabilize equipment platforms. If fences are cut they shall be repaired when the company leaves the area. Any gates opened to allow large vehicles to pass will be closed immediately.
- The U.S. Army, USACE, and BLM will conduct pre- and post-exercise inspection for environmental and cultural resources at the Patriot Battery sites. Photo documentation of each site would occur for pre- and post -exercise activities to document site conditions.
- The USACE will flag populations of noxious weeds identified by the BLM in the Dry Lake Valley. These sites would be flagged for avoidance prior to the proposed ADA activities.
- The U.S. Army shall ensure that all vehicles and heavy equipment used for the proposed ADA activities authorized for off-road driving, or that contact plant species listed on the Nevada Noxious Weed list or specifically identified by the Ely Field Office would be cleaned prior to continued use in weed-free areas.

- The U.S. Army shall present a tortoise-education program to all personnel that may encounter desert tortoise during the exercise.
- Prior to conducting ADA activities, the U.S. Army will have the LSA site cleared by a qualified tortoise biologist.
- The U.S. Army will have a qualified tortoise biologist periodically inspect the sites (LSA and Alamo Canyon Access Road) during the ADA activities to ensure desert tortoise has not moved onto the site.
- If desert tortoise or their sign are observed the observation shall be reported to the designated USFWS field contact representative.
- Activities that may endanger a tortoise will cease if a tortoise is found in harm(s) way as a result of the activity. Project activities will resume after the authorized biologist removes the tortoise from danger, the activity will avoid the tortoise, or after the tortoise has moved to a safe area.
- Tortoises found in harm(s) way shall be captured and relocated to undisturbed desert within 2 miles from the site found by an authorized desert tortoise biologist according to current approved protocol. Tortoises shall be deliberately moved solely for the purpose of moving them out of harm(s) way.
- The U.S. Army will police trash and debris at all sites daily, and store waste in sealed containers.
- Sites found to have experienced environmental damage requiring restoration will be restored by the U.S. Army as soon as practicable after the ADA activities are completed. Restoration methods if required will be determined in consultation between the U.S. Army and the BLM.
- ADA sites shall not be used if ponded or flowing water is present.
- Gray water will not be disposed of on public lands (43 CFR 8365.1-1).
- Ground-based personnel involved in the ADA activities shall remain at least a quarter of a mile from any known riparian water source.
- The U.S. Army will notify rancher permittees who are scheduled to graze cattle in the vicinity of the proposed ADA sites prior to the initiation of proposed ADA activities.
- The U.S. Army will place drip pans under all parked vehicles to avoid contaminating soils.
- The U.S. Army will prepare spill prevention and response plans for all field sites, and locate emergency response equipment at Patriot sites and the LSA. Soils contaminated by spills or cleaning wastes will be contained and removed by the U.S. Army to an approved disposal site. Disposal of hazardous wastes will be in compliance with the applicable laws and regulations.
- The U.S. Army will make Material Safety Data Sheets readily available to all personnel at the various sites.

Rationale: Approval of the proposed action will provide USAF and U.S. Army personnel with the required practical training to ensure combat ready forces during emergency situations and to protect the national security of the United States. Any impacts resulting from the proposed action will be minimized through the carefully planned proposed action, site selection criteria, prescribed doctrinal procedures outlined in their Army Training and Evaluation (ARTEP) manuals, series ARTEP 44-637-MTP and standard operating procedures developed for this exercise.

Finding of No Significant Impact: Based on the analysis it is determined that the proposed action will not have a significant effect on the quality of the human environment. An environmental impact statement (EIS) level of analysis is not required.

Rationale: The determining factors weighed in reaching a Finding of No Significant impact are:

- The proposal is in conformance with all Federal, State, and local planning and laws imposed for the protection of the environment.
- The proposed action will have no effect on human health or safety.
- The project would not adversely affect air quality.
- The action will have no adverse effects on the human health or environment of minority or low income populations.
- The potential impacts from implementation of this proposal are not controversial and do not involve unique or unknown risks to the quality of the human environment.
- The action would not impact floodplains, wetlands, and riparian areas; wilderness values, Areas of Critical Environmental Concern; wild and scenic rivers; prime or unique farmlands; environmental justice; paleontological, cultural, and historical resource values; Native American religious concerns; or migratory birds.
- The action would not result in significant impacts to rangeland or cattle grazing.
- The action would not result in significant impacts to an Endangered or Threatened Species or its habitat.
- The action would not adversely affect wild horses or their habitat.
- Any impacts due to the implementation of the project will be minimized as identified in the Environmental Assessment and by the adherence to the Standard Operating Procedures.

The cumulative impacts of the action have been analyzed and would not be significant.

Robert C. Barrett
Chairperson
ACC Environmental Leadership Board

1 Mar 05
Date

CONCUR:

Jeffrey A. Weeks
Assistant Field Manager
Nonrenewable Resources
Bureau of Land Management

2-25-05
Date

Tantalous A. Smith LTC, AD
Chief, Roving Sands Branch
Joint Interoperability Division, G3/5/7
Forces Command, U.S. Army

24 Feb 05
Date

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LIST OF ACRONYMS AND ABBREVIATIONS

AAR	=	After Action Reviews
ADA	=	Air Defense Artillery
AR	=	Army Regulation
Army	=	U.S. Army
ARTEP	=	Army Training and Evaluation
BA	=	Biological Assessment
BAPC	=	Bureau of Air Pollution Control (Nevada)
BAQP	=	Bureau of Air Quality Planning (Nevada)
BLM	=	Bureau of Land Management
BLUFOR	=	Allied or "Blue" Forces
CAA	=	Clean Air Act (Federal)
CAPP	=	Chemical Accident Prevention Program
CCC	=	Command and Control Center
CCD	=	Census County Divisions
CCDAQM	=	Clark County Department of Air Quality Management
CCFD	=	Clark County Fire Department
CDFG	=	California Department of Fish and Game
CEQ	=	Council on Environmental Quality (40 CFR Parts 1500-1508)
CERCLA	=	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CFR	=	U.S. Code of Federal Regulations
CO	=	Carbon Monoxide
CWA	=	Clean Water Act of 1977 (33 U.S.C. 1251 et seq.) (formerly the Federal Water Pollution Control Act of 1972)
dB	=	Decibel
dBA	=	Decibel (A-weighting network)
DOD	=	Department of Defense
DoDI	=	Department of Defense Instruction
DOE	=	U.S. Department of Energy
DOI	=	U.S. Department of the Interior
DOT	=	U.S. Department of Transportation
EA	=	Environmental Assessment
EDR	=	Environmental Data Resources, Inc.
EIAP	=	Environmental Impact Analysis Process
EIS	=	Environmental Impact Statement
EPF	=	Environmental Planning Function
ESA	=	Endangered Species Act of 1973, 1988 Amendments (16 USC § 1531 et seq.)
FAA	=	Federal Aviation Authority
FOC	=	Fiber Optic Cable
FONSI	=	Finding of No Significant Impact
GPS	=	Global Positioning System
HAZMART	=	Hazardous Material Pharmacy

HMA	=	Herd Management Areas
HMMWV	=	High-Mobility Multipurpose Wheeled Vehicle
IM	=	Instruction Memorandum
JNTC	=	Joint National Training Capabilities
JRF-05	=	Joint Red Flag '05 Exercise
L01	=	Percentile noise level that refers to the sound level that is exceeded for 1% of the time over which the sound is measured
L10	=	Percentile noise level that refers to the sound level that is exceeded for 10% of the time over which the sound is measured
L50	=	Percentile noise level that refers to the sound level that is exceeded for 50% of the time over which the sound is measured

Percentile noise level that refers to the sound level that is exceeded for 90% of the time over which the sound is measured

Ldn	=	Day-Night Average Sound Level
Leq	=	Equivalent Continuous Sound Level
Lmax	=	Maximum Sound Level
Lmin	=	Minimum Sound Level
LSA	=	Logistic Support Site
lsd	=	land surface datum
LUST	=	Leaking Underground Storage Tanks
MOA	=	Military Operating Areas
NAAQS	=	National Ambient Air Quality Standards
NAC	=	Nevada Administrative Code
NAFB	=	Nellis Air Force Base
NATO	=	North Atlantic Treaty Organization
NDEP	=	Nevada Division of Environmental Protection
NDOT	=	Nevada Department of Transportation
NDOW	=	Nevada Department of Wildlife
NEPA	=	National Environmental Policy Act (42 USC § 4321 et seq.)
NNHD	=	Nevada Natural Heritage Division
NOx / NO_2	=	Oxides of Nitrogen / Nitrogen Dioxide
NPDES	=	National Pollution Discharge Elimination System
NPS	=	U.S. National Park Service
NRS	=	Nevada Revised Statues
NTTR	=	Nevada Test and Training Range
OSHA	=	U.S. Department of Labor Occupation Safety & Health Administration
PCB	=	Polychlorinated Biphenyls
PEL	=	Permissible Exposure Limit
PM10 / PM2.5	=	Fine Particulate Matter

rces

RF	=	Radio Frequency
RMP	=	Resource Management Plan
SFF	=	State Forester Firewarden

SHPO	=	State Historic Preservation Office
SIP	=	State Implementation Plan
SOP	=	Standard Operating Procedures
SO_x / SO_2	=	Oxides of Sulfur / Sulfur Dioxide
Superfund	=	Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
SWPPP	=	Storm-Water Pollution Prevention Plan
TRI	=	Toxic Releases
TSCA	=	Toxic Substance Control Act
USAF	=	United States Air Force
U.S. Army	=	United States Army
USACE	=	United States Army Corps of Engineers
USC	=	U.S. Code
USEPA	=	United States Environmental Protection Agency
USFS	=	United States Forest Service
USFWS	=	United States Fish and Wildlife Service
USGS	=	United States Geological Survey
UST	=	Underground Storage Tanks
VOC	=	Volatile Organic Compounds
VRM	=	Visual Resource Management
WMA	=	Wildlife Management Area

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

This Environmental Assessment (EA) presents an analysis of potential environmental impacts that would result from the proposed participation of one of the United States Army's Air Defense Artillery (ADA) battalions in a military training exercise known as "Joint Red Flag '05" (proposed ADA activities). The proposed ADA activities would be conducted on Bureau of Land Management (BLM) lands under airspace controlled by Nellis Air Force Base (NAFB) in Lincoln County, Nevada. Preparation of the EA complies with the National Environmental Policy Act (NEPA) (42 U.S. Code [USC] § 4321 et seq.); the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500–1508); Department of the Army Environmental Analysis of Army Actions (32 CFR 651); Department of the Air Force Environmental Impact Analysis Process (EIAP) (32 CFR 989) Instruction 32-7061, which implements NEPA and CEQ regulations for Air Force Actions; and BLM 43 CFR 100, Planning Regulations (Instruction Memorandum [IM] 2001-03).

ES.2 PURPOSE AND NEED

The purpose of the proposed ADA activities is to conduct an overall exercise involving ground-to-air, air-to-air, and air-to-ground combat scenarios in a combined multi-service arms setting that realistically replicates probable combat conditions. These combined elements provide a simulated combat environment to allow training and evaluation of multi-service commanders, forces, and equipment. The proposed ADA activity is sponsored by the Joint National Training Capabilities (JNTC) and the Joint Forces Command to take advantage of several other exercises occurring during this time period throughout the United States, such as Roving Sands '05, which occurs at Fort Bliss, Texas. These exercises are to be electronically linked for a large scale joint exercise. The large area proposed for the ADA activities, including the use of BLM lands, is required to due to the scope of the exercise. The ADA activities provide U.S. Air Force (USAF) and U.S. Army personnel with the required practical training to ensure combat ready forces during emergency situations and to protect the national security of the United States. Training on defense systems is necessary to maintain combat readiness and refine response time, accuracy, and alertness. Dynamic new developments in weapons systems and tier components also require consistent training. In addition, this training is in demand as new troops are enlisted and others are promoted or transferred. Military units involved in the proposed ADA activities would include USAF personnel, regular U.S. Army units, and both U.S. Army Reserve and National Guard troops.

ES.3 DESCRIPTION OF THE PROPOSED ACTION

The proposed ADA activity simulates a battle between allied and adversary air and ground forces. The ADA activities would be conducted on BLM land located primarily under the Military Operating Areas (MOA) of NAFB in Lincoln County, Nevada, and would involve ground units from one of the U.S. Army's ADA Battalions, and aircraft from NAFB. The ADA sites, as well as a Logistic Support Area (LSA), would be located in an area encompassing approximately 2.5 million acres of rangeland. In order to simulate the combat situation, the exercise participants would be divided into allied, or "Blue Forces" (BLUFOR) and adversary, or "Red Forces" (REDFOR). Both opposing forces would deploy

aircraft during the proposed ADA activities. During the proposed ADA activities, the allied side would deploy ground-based missile systems at a combination of pre-selected sites and areas of opportunity on BLM-approved dirt access roads. The opposing forces would then try to identify, target, and electronically defeat the other's systems and tactics. No live firing, no blanks, and no flares from ground or air are included as part of the ADA activities.

The Patriot, Avenger, and Sentinel Radar systems would provide allied ground-based air and missile defense in conjunction with BLUFOR aircraft in accordance with applicable joint publications, doctrine, and tactics. To meet BLM IM No. 2001-030, the operation would not be for a military maneuver area, but would use radar or similar systems for tracking the training missions.

During the proposed ADA activities, approximately 200 vehicles and 500 personnel would deploy to eight possible Patriot sites. Mobile Avenger and Sentinel units would range along dirt roadways within Lincoln County. The ADA activities would also be supported from one LSA site.

Based on the tactical scenario it is not known which of the Patriot sites would be occupied. However, only two of the Patriot sites would be used at any given time during the proposed ADA activities. Each Patriot site would occupy an area of approximately one square kilometer, km^2 (250 acres); however, activities would generally be limited to a one-quarter km^2 (60 acre) section of the approved site. Patriot sites would support approximately 32 vehicles and 85 soldiers. Soldiers occupying the Patriot sites would bivouac at these sites for the duration of the proposed ADA activities. The Avenger and Sentinel systems would deploy to transient sites during the proposed ADA activities. These sites would contain one or two Avenger or Sentinel units or a rubber-tired communication vehicle. Transient sites would be utilized for no more than four hours and would be limited to within 50 meters (164 feet) of existing roads or trails. Mobile units would not leave existing roadways in areas identified as potential desert tortoise habitat. Crews operating the Avenger and Sentinel units would bivouac at approved ADA Patriot sites. The LSA site would be located at the Alamo Airfield, a private dirt landing field located west of the community of Alamo.

The proposed ADA activities would be conducted during a four-week period which includes preparation and post-exercise critique. The main portion of the proposed ADA activities is scheduled to occur during a two-week period from 17 March to 02 April, 2005. The ground-based systems would deploy on or about 15 March 2005, and return to the NAFB staging area from the proposed ADA activity area between 02 and 04 April, 2005 for redeployment to Fort Bliss.

At the conclusion of the live-fly portion of the proposed ADA activities and demobilization of the ADA batteries, each ADA site utilized during the proposed ADA activities would be inspected by the 2-43 Battalion environmental monitoring teams and representatives of the BLM.

ES.4 SUMMARY OF ENVIRONMENTAL EFFECTS

Implementation of the proposed ADA activities would not result in any significant impacts to air quality, biology, cultural resources, water or geological resources, land use, visual resources, recreation, noise, socioeconomics, transportation, hazardous materials and waste handling and disposal, or utilities and public services. Several mechanisms have been incorporated into the proposed ADA

activities that would reduce or avoid potential impacts to sensitive resources. These include site selection criteria designed to avoid sensitive areas, prescribed doctrinal procedures outlined in U.S. Army Training and Evaluation (ARTEP) manuals, series ARTEP 44-637-MTP, established approval and operating procedures, and Standard Operating Procedures (SOPs) developed to reduce or avoid impacts. In addition, the proposed ADA activities are not anticipated to have any long-term adverse impacts to environmental resources. A summary of potential impacts resulting from implementation of the proposed ADA activities is presented in Table ES-1 and a short description of each issue area is described below.

Air Quality

There may be the potential for short-term adverse impacts to recreational users and the few area residents that live in the general area due to air pollutant emissions accumulating during low-level temperature inversions, or from dust emissions that may occur during travel on unpaved roads. Additionally, at a few of the proposed ADA locations, the potential for dust emissions may be exacerbated by the fine soil conditions that occur (i.e., near dry lake beds).

Implementation of SOPs would reduce the activity-related emission potential, particularly diesel idling emissions and fugitive dust emissions from travel on unpaved road surfaces. In addition, the emissions from the proposed ADA activities are well below the General Conformity *Rule de minimis* annual emission thresholds within the Las Vegas Valley area, which is designated nonattainment for fine particulate matter (PM_{10}) and Carbon Monoxide (CO). In conclusion, no significant air quality impacts would occur from the proposed ADA activities.

Biological Resources

No significant impacts to biological resources would occur because the proposed ADA activities would either be located away from sensitive habitat or incorporate measures to avoid impacts to sensitive species. The proposed ADA activities would also avoid all designated areas of critical environmental concern and wilderness areas, avoid the exclusion period for migratory birds, and incorporate measures to reduce the spread of noxious weeds. In addition, Patriot sites would not be located within the boundaries of any herd management areas (HMA).

Implementation of the proposed ADA activities could result in temporary damage to existing vegetation, but would not involve the removal or substantial disruption of surface soil layers and would not be considered significant. Potential impacts to grazing land are expected to be minimal as Patriot sites have been located in areas to minimize potential impacts to foraging land and any damage would be repaired upon completion of the proposed ADA activities.

No threatened or endangered plants were observed at the proposed ADA sites or are expected to occur in the proposed ADA activity area. The sensitive resources with the potential to occur in the area (i.e., several state listed sensitive plants, the federally threatened desert tortoise, and five species of special concern, including chuckwalla, banded Gila monster, burrowing owl, ferruginous hawk, and pygmy rabbit) would be avoided. Desert tortoise is known to occur in the region surrounding the LSA site; however, protocol surveys in this area did not detect the presence of this species. No tortoise habitat occurs at any of the proposed Patriot sites. There is also the potential for this species to occur along the

Alamo Canyon Road which leads into the Delamar Valley. Surveys in this area detected the presence of tortoise in adjacent habitat. In order to avoid impacts to this species, mobile Avenger and Sentinel units would not leave existing roadways in areas identified as potential desert tortoise habitat. To further reduce impacts to desert tortoise, the following SOPs would be implemented:

- The U.S. Army shall present a tortoise-education program to all personnel that may encounter desert tortoise during the exercise.
- Prior to conducting ADA activities, the U.S. Army will have the LSA site cleared by a qualified tortoise biologist.
- The U.S. Army will have a qualified tortoise biologist periodically inspect the sites (LSA and Alamo Canyon Access Road) during the ADA activities to ensure desert tortoise has not moved onto the site.
- If desert tortoise or their sign are observed, the observation shall be reported to the designated U.S. Fish and Wildlife Service (USFWS) field contact representative.
- Activities that may endanger a tortoise will cease if a tortoise is found in harm(s) way as a result of the exercise. ADA activities will resume after the authorized biologist removes the tortoise from danger, the activity will avoid the tortoise, or after the tortoise has moved to a safe area.
- Tortoises found in harm(s) way shall be captured and relocated to undisturbed desert within two miles from the site found by an authorized desert tortoise biologist according to current approved protocol. Tortoises shall be deliberately moved solely for the purpose of moving them out of harm(s) way.
- The U.S. Army will police trash and debris at all sites daily, and store waste in sealed containers.

By implementing these SOPs, impacts to desert tortoise would be avoided.

Water and Geological Resources

The proposed ADA activity has the potential to affect surface and groundwater resources in the region. These include potential effects associated with temporary disturbance of soil and dirt roadways, and the on-site use and storage of fuel at each of the Patriot sites. Other potential impacts to water resources could occur from refueling vehicles or equipment, particularly mobile Avenger units and generators, and use of solvents or cleaning agents during routine maintenance of equipment. However, with the implementation of standard military practices and the SOPs identified in the EA, impacts would be less than significant.

Land Use

With the exception of the LSA site and one ADA site, the proposed Patriot sites would be located in remote areas on land that is designated for livestock grazing and recreational activities. None of the proposed Patriot sites would be located inside the 14 designated Wilderness Areas in Lincoln County. In order to avoid impacts to current land uses, the sites were selected to minimize impacts to prime grazing facilities, such as corrals and stock tanks, unless approved by the BLM, and other restricted areas. Implementation of the proposed ADA activities would allow military activities to occur in conjunction with other land uses. However, these impacts would be temporary, of limited duration, and any impacts to grazing areas would be restored at the completion of the ADA activities. The U.S. Army would also obtain a temporary land use permit from the BLM and coordinate with permittees, which would serve to reduce impacts to grazing to a less-than-significant level. To prevent access to the sites during the ADA activities and to protect the public and wildlife, temporary exclusion fencing (flagging,

exclusion tape, or snow fencing) would be erected around each of the ADA sites immediately prior to the activities, and would be removed immediately following the activities.

Sensitive land use receptors that may be affected by the proposed ADA activities would include the Pahranagat Valley Senior Citizens Center located on Airport Road, the Pahranagat Valley Middle School located on 1st Street South, and residences located along the aforementioned roads in Alamo. Potential impacts to these sensitive receptors could occur from noise generated during the proposed ADA activities (see Noise below). In order to reduce potential land use impacts to a less-than-significant level, components of the proposed ADA activities would include accessing the LSA via Broadway/1st Street West/Airport Road to minimize potential noise impacts to Pahranagat Middle School. Additionally, the U.S. Army would post announcement notices at various locations in Pahranagat Valley, which would state specifically when the proposed ADA activities will occur and provide contact information for questions or comments. With implementation of these components of the proposed ADA activities, if required, impacts to sensitive land use receptors would be less than significant.

Visual Resources

The proposed ADA activities would occur on BLM land that is classified as Visual Resource Management (VRM) Class IV. Under the Class IV management guidelines, temporary activities that do not result in substantial changes to the environment would not result in significant impacts. As the proposed ADA activities would be of short duration and would not result in permanent changes to the viewscape, no significant impact would occur.

Recreation

The proposed ADA sites and the LSA are located on BLM land that is used for a number of recreational activities including hunting, off-road vehicle use, mountain biking, and hiking. However, the proposed ADA activities would not restrict access to recreational facilities and would have no impact on the use of these facilities. Activities associated with the proposed ADA activities could result in a short-term disruption to recreation users seeking access to remote and rarely utilized scenic areas. However, these areas are over flown by routine military aircraft training, and ground activities would be of limited duration. As such, impacts to recreational users may be temporarily adverse but not significant.

Noise

The proposed ADA activities would have the potential to increase noise in the areas in which they occur. However, much of the existing noise would occur from the air portion of the exercise, which is not part of the ADA activities analyzed in the EA. Short-term disturbance to grazing animals and residences of the surrounding communities (Alamo and Crystal Springs) could arise as a result of increased noise levels. However, most of the noise associated with the proposed ADA activities is anticipated to be at relatively low levels, intermittent and temporary (approximately two weeks in duration), and would generally occur in rural, unpopulated areas where there are little or no sensitive noise receptors. To minimize potential impacts from noise in the community of Alamo, travel through the community would be limited to daylight hours only, to the extent possible. Other than the LSA,

none of the other ADA sites would be located in or near designated noise sensitive areas. Additionally, the Avenger and Sentinel units would avoid noise sensitive areas to the extent feasible.

To reduce noise impacts associated with use of the LSA, the U.S. Army has committed to accessing the LSA site via Broadway/1st Street West/Airport Road. 1st Street South would not be used to access the LSA site to minimize impacts to Pahranagat Middle School. Additionally, the U.S. Army would post announcement notices at various locations in Pahranagat Valley, including the Post Office, Alamo Annex, the Sheriff's Office, and the local grocery store/gas station. In the event of complaints by nearby residents, environmental monitoring teams would assess noise impacts and implement feasible measures to reduce noise levels, such as relocating tents, kitchen, shower/bathing facilities, etc. With implementation of these components of the ADA activities, as required, noise impacts would be less than significant.

Socioeconomics

The proposed ADA activities would primarily occur within Lincoln County, would be short-term, and only military personnel and military contractors would be involved in preparing, conducting, and reviewing the activities. Implementation of the proposed ADA activities would neither place a demand on employment opportunities, housing, or public facilities, nor would it create new employment opportunities, housing, or public facilities in the region. Consequently, the proposed ADA activities would not create socioeconomic impacts within the adjacent communities and no impacts would occur.

Transportation

Traffic would temporarily increase during deployment, operations, and demobilization phases of the proposed ADA activities. Potential issues include additional congestion on local roadways, and delays for highway travelers caused by a slow-moving convoy. To minimize potential impacts to traffic and transportation during initial deployment of equipment and personnel, a single convoy would begin at NAFB in North Las Vegas and head to the proposed battle areas in Lincoln County. Impacts would also be reduced by scheduling the convoy to avoid traveling in urban areas (i.e., North Las Vegas) during peak traffic hours. With respect to the major highways, additional traffic along U.S. Highway 93 in Lincoln County would have only a minor impact on the existing good level of service on this highway. Just south of Alamo, the convoy would begin to disperse to the various field sites generally using rural, unpaved (dirt) roads. Traffic on these roads is generally very limited.

Implementation of the proposed ADA activities would not require the closure of any roadways, would not substantially disrupt current transportation patterns and systems, would not degrade existing levels of service, would not limit access to or from adjacent land uses, and would not restrict emergency vehicle access. Therefore, less-than-significant impacts to traffic would occur as a result of the proposed ADA activities.

Hazardous Materials and Waste Handling and Disposal

The relatively small quantity of hazardous materials, such as diesel, gasoline, oils, lubricants, solvents, portable toilets, and copper grounding rods (for grounding electrical equipment), involved in the proposed ADA activities would not be expected to pose as a significant public health and safety hazard

through release of emissions or risk of upset. However, safety risks associated with the use of hazardous materials would still exist. These safety risks would be reduced through established hazardous materials and waste management and spill prevention, control, and countermeasures procedures employed by the military to preclude adverse impacts. Additionally, the use of a HAZMART would help to identify the least hazardous product appropriate for the task, provide for proper labeling of materials, and provide instructions on handling of hazardous materials. Safety risks would be further reduced to less-than-significant levels with implementation of SOPs, such as using drip pans, preparing a spill prevention and response plan, and restoring any sites found to have experienced environmental damage.

Cultural Resources

The Great Basin region is known to contain a variety of cultural and historic resources. Several known cultural sites have been recorded in or near the vicinity of the proposed ADA sites. To reduce potential impacts to these resources, all cultural resource areas have been located and would be avoided during implementation of the proposed ADA activities. As the proposed ADA activities would avoid known sites and would not result in excavation or brush clearance, the proposed ADA activities would have no adverse effect on cultural resources and impacts would be less than significant.

Utilities

The proposed ADA activities would generally occur in a rural area, although some of the proposed ADA sites are located directly adjacent to and/or within utility corridors. However, the underground utility lines would not be disrupted by the proposed ADA activities as no digging would occur at any of the sites. Overhead utility lines would have the potential to interfere with ground-related exercise operations, in so far as equipment movement may be hindered. However, none of the equipment involved in the proposed ADA activities would exceed clearance requirements for maneuvering around and between overhead utility lines. It should also be noted that each Patriot site would be equipped with a generator, and Avenger and Sentinel units would obtain power from battery-operated power supplies or directly from the vehicles. No "tapping" into existing utilities would occur. Therefore, no impacts to utilities would occur.

1. INTRODUCTION

1.1 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) presents an analysis of potential environmental effects that could result from the participation of one of the United States Army's Air Defense Artillery (ADA) battalions in a proposed military training exercise known as "Joint Red Flag '05" (proposed ADA activities). The proposed ADA activities would be conducted on Bureau of Land Management (BLM) lands under airspace controlled by Nellis Air Force Base (NAFB). Preparation of the EA complies with the National Environmental Policy Act (NEPA) (42 U.S. Code [USC] § 4321 et seq.), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500–1508); Department of the Army Environmental Analysis of Army Actions (32 CFR 651); Department of the Air Force Environmental Impact Analysis Process (EIAP) (32 CFR 989) Instruction 32-7061, which implements NEPA and CEQ regulations for Air Force Actions; and BLM 43 CFR 100, Planning Regulations (Instruction Memorandum [IM] 2001-03).

This EA is being prepared to evaluate environmental impacts of military ground forces from the proposed ADA activities. The EA considers the proposed ADA activities at site locations and their potential impact, or interaction, with biological and cultural resources, water and geology, air quality, hazardous waste, traffic and transportation, economic development, noise, and other NEPA requirements. Previous environmental documents have already evaluated impacts of the annual air-to-air combat training portions of the Red Flag Exercises. As described in this EA, no significant impacts would result from implementation of the proposed ADA activities.

1.2 PROJECT SUMMARY AND BACKGROUND

Large-scale, multi-force, military training exercises regularly occur at NAFB and the Nevada Test and Training Range (NTTR) located in southwestern Nevada. These exercises, known as Red Flag exercises, provide for realistic joint training for Multi-service and North Atlantic Treaty Organisation (NATO) forces. These exercises routinely consist of air-to-air combat training that is conducted within the airspace over the NTTR. In March 2005, the Red Flag Exercises would introduce ground-based ADA and radar unit operations on BLM managed public lands. This would include Army Patriot and Avenger Batteries and Sentinel Radar Systems. The proposed ADA activity is partly sponsored by the Joint National Training Capability (JNTC) office.

Among the agencies involved in the proposed ADA activities are the U.S. Air Force (USAF) and U.S. Army. The air operations of Red Flag Exercises have been occurring for many years and are described in numerous NEPA documents including the Nellis (now NTTR) Air Force Range Renewal Legislative Environmental Impact Statement (USAF, 1999). What makes this Joint Red Flag different from other Red Flags is the introduction of U.S. Army ADA ground activities.

1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed ADA activities is to provide high quality realistic training for Army units. This involves conducting an overall exercise involving ground-to-air, air-to-air, and air-to-ground

combat scenarios in a combined multi-service arms setting that realistically replicates probable combat conditions. The proposed ADA activity is sponsored by the JNTC and the Joint Forces Command to take advantage of several other exercises occurring during this time period throughout the United States, such as Roving Sands '05, which occurs at Fort Bliss Texas. These exercises are to be electronically linked for a large scale joint exercise. These combined elements provide a simulated combat environment to allow training and evaluation of multi-service commanders, forces, and equipment. The exercise provides USAF and U.S. Army personnel with the required practical training to ensure combat-ready forces during emergency situations and to ensure the national security of the United States. Training on defense systems is necessary to maintain combat readiness and refine response time, accuracy, and alertness. The large area proposed for the ADA activities, including the use of BLM lands, is required to due to the scope of the exercise. BLM lands occur within the air operations areas of NAFB and military aircraft regularly over fly this area. In order to simulate potential battlefield conditions, ensure safety, and to meet training objectives a large training area must be available to ground troops. This requires the use of BLM lands surrounding NAFB, as the base itself would not provide the needed area. In addition, dynamic new developments in weapons systems and tier components also require consistent training. This training is also in demand as new troops are enlisted and others are promoted or transferred. Military units involved in the proposed ADA activities could include USAF personnel, regular U.S. Army units, and both U.S. Army Reserve and National Guard troops.

2. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

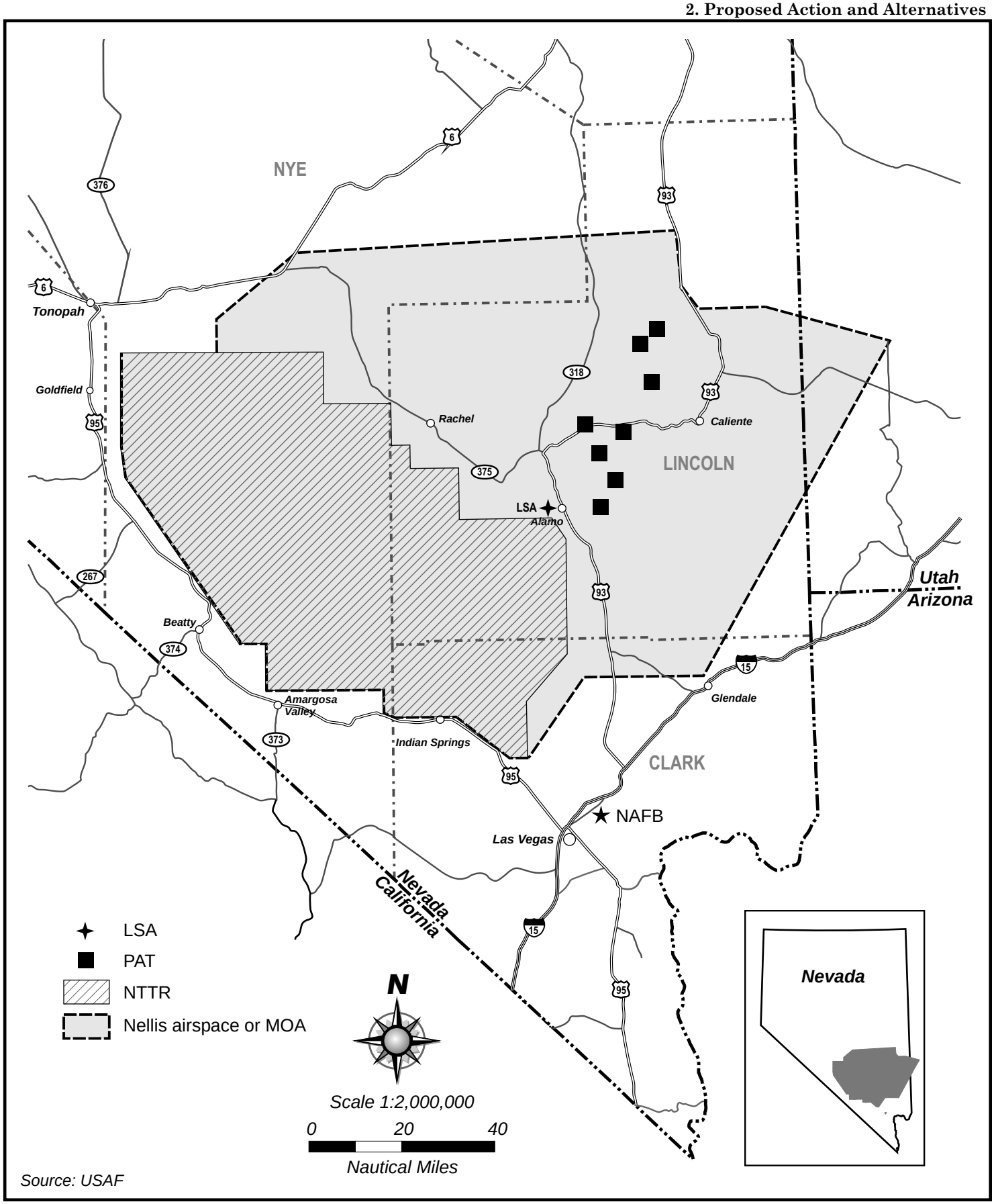
This section presents a description of the proposed action and alternatives, including the No Action alternative. One of the most important aspects of the NEPA environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a proposed action. In addition to mandating consideration of the No Action Alternative, NEPA Regulations (40 CFR § 1502.14) emphasize the selection of a range of reasonable alternatives and the adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision-makers. Two Alternatives and the No Action Alternative were identified as options for the proposed ADA activities. These alternatives were selected using a typical screening process and are considered to represent a reasonable range alternatives. Site visits and review of existing environmental documents provided the environmental settings for these alternatives.

Feasible alternatives that did not clearly offer the potential to reduce significant environmental impacts and alternatives that do not conform to the NEPA requirements for feasibility (reasonableness) were removed from further analysis. In the final phase of the screening analysis, the environmental advantages and disadvantages of the remaining alternatives were carefully weighed with respect to potential for overall environmental advantage, technical feasibility, and consistency with the purpose and need of the proposed ADA activities.

2.2 DESCRIPTION OF THE PROPOSED ACTION

The proposed ADA activities would be conducted on BLM lands located primarily under the Military Operating Areas (MOA) of NAFB. All of the proposed ADA sites, including the Logistic Support Area (LSA) would be located in an area encompassing approximately 2.5 million acres within Lincoln County, Nevada (Figure 2-1). Participants and equipment for the proposed ADA activities would travel from NAFB in Clark County, Nevada. In order to simulate a combat situation, the exercise participants would be divided into allied, or "Blue Forces" (BLUFOR), and adversary, or "Red Forces" (REDFOR). Both opposing forces would deploy aircraft during the proposed ADA activities. During the proposed ADA activities, the allied side would deploy ground-based missile systems at a combination of pre-selected sites and areas of opportunity on BLM-approved dirt access roads. The opposing forces would then try to identify, target, and electronically defeat the other's systems and tactics. No live firing, no blanks, and no flares from ground or air would be included in the proposed ADA activities.

The exercise arena simulates a front between allied and adversary forces. In general, BLUFOR units would be located in the east side of the NTTR, and REDFOR in the west side. The BLUFOR aircraft travel west to engage REDFOR aircraft while exercising their ability to locate, intercept, and neutralize those threats. Patriot, Avenger, and Sentinel Radar Systems (i.e., ADA units) would be deployed on BLM land located within the NTTR, and would provide allied ground-based air and missile defense in conjunction with BLUFOR aircraft in accordance with applicable joint publications, doctrine, and



Regional Map with ADA Locations

Joint Red Flag '05 ADA Activities

Figure 2-1

tactics. Only the ADA units would be emplaced on BLM lands and would be considered for analysis in this document.

Aircraft operations are part of the ongoing Red Flag Exercises, would range within NTTR airspace, and would not be limited to activities over BLM land. Currently, up to 200 vehicles and 500 personnel would deploy to field sites located in Lincoln County for the ground-based ADA activities. The analysis contained in this EA evaluated nine possible locations that could be utilized during the proposed ADA activities. These include one LSA site, located on private land, and eight Patriot sites, located on BLM land. However, during the proposed ADA activities only two Patriot sites would be occupied at any given time. To meet BLM IM No. 2001-030, the operation would not be for a military maneuver area, but would use radar or similar systems for tracking of training missions. Simulated enemy radar is normally authorized using a communication site during an exercise of this type.

During the proposed ADA activities, REDFOR strike aircraft would fly from the west toward the east range and attempt to intercept and neutralize BLUFOR aircraft and ground-based ADA units. The ground-based units would, in turn, exercise their ability to detect and defeat the incoming REDFOR aircraft. In addition to the BLUFOR and REDFOR units, the proposed ADA activities would also contain a neutral force composed of personnel monitoring the exercise. Those personnel would control the exercise and monitor its progress, test new equipment or procedures, ensure safety, and ensure compliance with environmental restrictions.

The proposed ADA activities would be conducted during a four-week period which includes preparation and post-exercise critique. The main portion of the proposed ADA activities is scheduled to occur during a two-week period from 17 March to 02 April, 2005. The ground-based systems would deploy on or about 15 March 2005, and return to the NAFB staging area from the proposed ADA activity area between 02 and 04 April, 2005 for redeployment to Fort Bliss, Texas.

The proposed ADA activities involve the following phases in planning, conducting, and closing out the exercise: (1) exercise preparation, (2) deployment of forces and joint training exercise, and (3) exercise review.

2.2.1 Exercise Preparation

The exercise preparation phase includes selecting sites and alternative sites that may be used by ground forces, conducting any site preparation required prior to deployment, such as photo documentation and environmental inspection, and refining standard operating procedures (SOPs) to ensure compliance with environmental requirements for avoidance of adverse impacts to sensitive resources.

Site Selection

During the proposed ADA activities, ground-based field units would deploy into five area types: Patriot, Sentinel and Avenger mobile/transient units, the Command and Control Center (CCC), and the LSA. A total of nine sites have been selected by multidisciplinary environmental teams for possible use during the proposed ADA activities. These include eight Patriot sites, one LSA site, and the CCC

which would be placed at the proposed Patriot 3 site (Figure 2-2). Although eight Patriot sites have been identified for possible use, only two Patriot sites (i.e., two Patriot batteries) would be utilized at any given time during the exercise. The CCC site, located at the Patriot 3 site, would remain in place during the entire exercise. Depending on mission requirements, this site could also support a Patriot battery. This allows for flexibility in responding to the tactical scenarios and allows commanders to evaluate the decisions made by the field units. Two of the proposed sites are located on or adjacent to existing dirt airstrips (LSA and Patriot 3/CCC). During military air exercises, including during the proposed ADA activities, civilian air traffic is restricted and these airfields would not be subject to civilian use. NAFB would coordinate with BLM and Federal Aviation Authority (FAA) air operations group regarding civilian airspace restrictions.

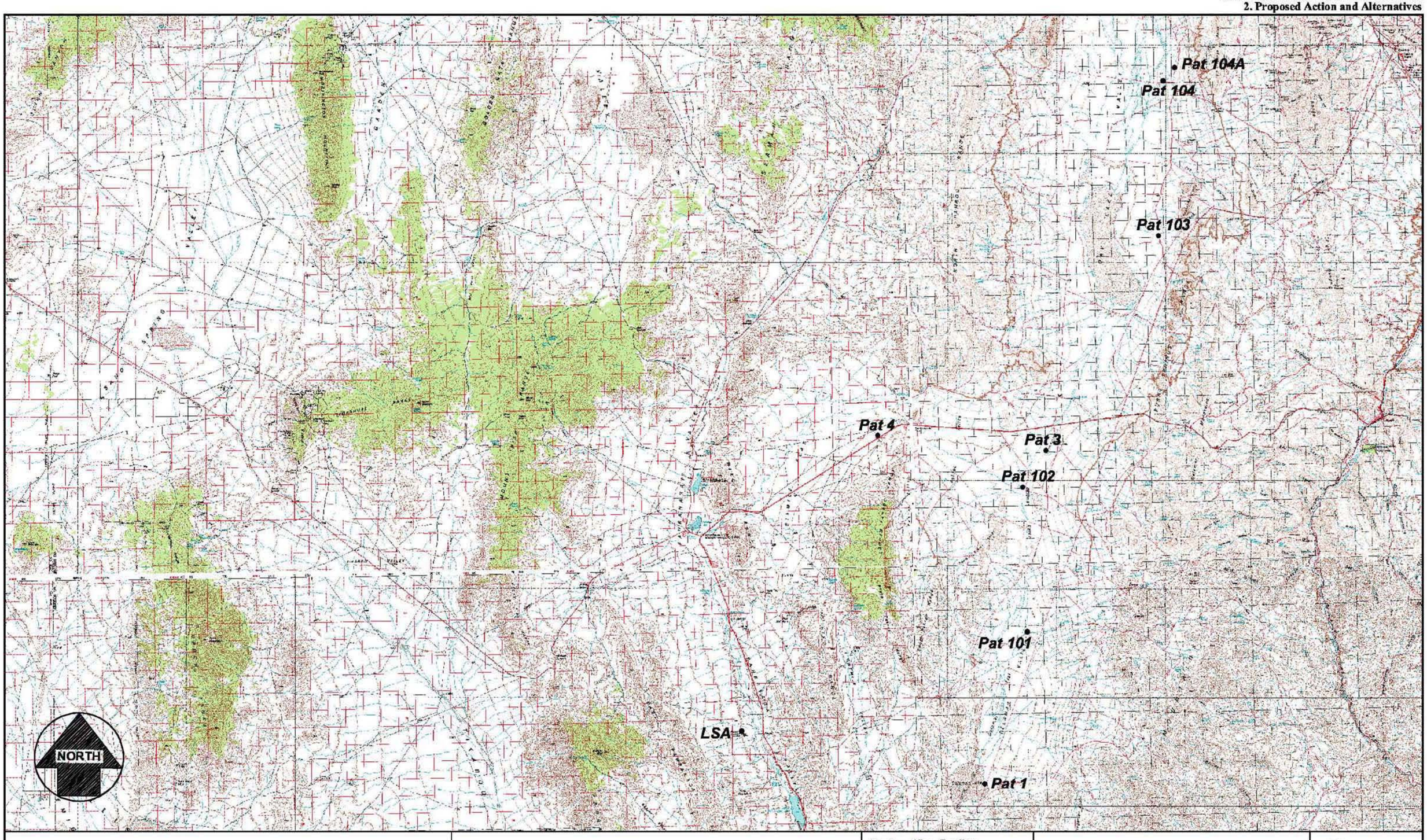
The Avenger and Sentinel mobile/transient units would be located on or adjacent (within 50 meters or 164 feet) to existing dirt access roads, and would be located at sites of opportunity as needed during the exercise. The specific details of each site type are described in Section 2.2.2. The proposed ADA Patriot sites were selected at locations that would provide the most meaningful training opportunities for exercise combatants while minimizing or avoiding impacts to sensitive resources. All sites, including the dirt access roads, will be selected based on established training and environmental criteria. The environmental criteria were designed to minimize potential impacts to sensitive environmental and cultural resources. These criteria include, but may not be limited to, the following:

Training Criteria:

- Located within 50 meters (164 feet) of an existing road or trail
- Slope less than 10 percent
- Site has to have adequate tactical radar viewing angles
- Sites need line-of-site (or one relay point) visibility from each other and the CCC.

Environmental Criteria:

- Avoid significant cultural resources
- Avoid locations that may impact federally or state listed threatened, endangered, or candidate species and species of special concern
- Avoid areas considered sensitive because of high biodiversity
- Avoid arroyos and riparian habitat
- Avoid grazing facilities, such as corrals and stock tanks unless approved by the BLM
- Avoid areas containing important wildlife habitat
- Avoid Areas of Critical Environmental Concern (To be delineated on maps and provided to ADA units)
- Remain outside Wilderness Study Areas (To be delineated on maps and provided to ADA units)
- Avoid locations with low or poor bearing soils
- Avoid restricted areas.



	Joint Red Flag '05 ADA Activities	Scale: 1" = 5 miles Date: February 15, 2005 File: 9313nellisafbpt3.dwg	ADA Site Locations	Figure 2-2

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Prior to site occupation, each of the proposed ADA sites would be surveyed by a multidisciplinary team for biological and cultural resources, and would be environmentally approved by the 2-43 Battalion environmental monitoring teams, which would consist of an Environmental Compliance Officer, USAF/U.S. Army personnel, BLM representatives, and Field Sanitation teams from the battalion. The ADA sites would also receive environmental inspections during and after the proposed ADA activities. The exact location of the Patriot sites may be adjusted during the proposed ADA activities to further minimize potential environmental impacts. Site adjustments would only occur after consultation with the BLM and U.S. Army. Any proposed site adjustment would be required to comply with the site selection and environmental criteria identified in this EA.

Post-exercise inspection would be performed in coordination with the BLM to assess whether any permanent damage has occurred to the ADA sites and identify appropriate restoration strategies, if necessary. As part of the proposed ADA activities, BLM representatives would conduct compliance inspections at each phase of the operation, and function as part of the environmental monitoring teams.

The environmental monitoring teams would be assigned as each unit sets up during the proposed ADA activity period. The environmental monitoring teams would check to ensure that all units and personnel have arrived at their appropriate location, are familiar with their exercise roles, are aware of all environmental regulations and requirements, and have operational communication systems. Each ADA site location would be verified by a global positioning system (GPS) during the proposed ADA activities. Appendix E contains the Monitor Checklist used to ensure that units are properly set up and comply with environmental requirements. In addition, each unit would maintain site discipline in accordance with prescribed doctrinal procedures outlined in their Army Training and Evaluation (ARTEP) manuals, series ARTEP 44-637-MTP, to minimize potential impacts to sensitive resources.

2.2.2 Deployment of Forces and Joint Training Exercise

As stated earlier, the proposed ADA activities would consist of a simulated battle between BLUFOR and REDFOR forces attempting to locate and defeat each other's weapons and defense systems. The general flow of the "battle" is from east to west for BLUFOR and from west to east for REDFOR. No ordinance (e.g., explosives, flares, smoke grenades, or munitions simulators) would be expended during the proposed ADA activities and only simulated weapons would actually be fired during the exercise.

The ground-based units involved in the proposed ADA activities would include Patriot and Avenger Batteries, and Sentinel Radar Systems. Approximately 200 vehicles and up to 500 personnel would be involved in the proposed ADA activities and deployed to field locations. These include two Patriot Batteries that each contains approximately 32 vehicles and up to 85 soldiers; six Avenger Batteries that each contain one vehicle and two soldiers; and three Sentinel Radar Systems that each contain two vehicles and six soldiers. The proposed ADA activities would also involve associated command and control, maintenance, communication, troop carriers, and other support vehicles and personnel.

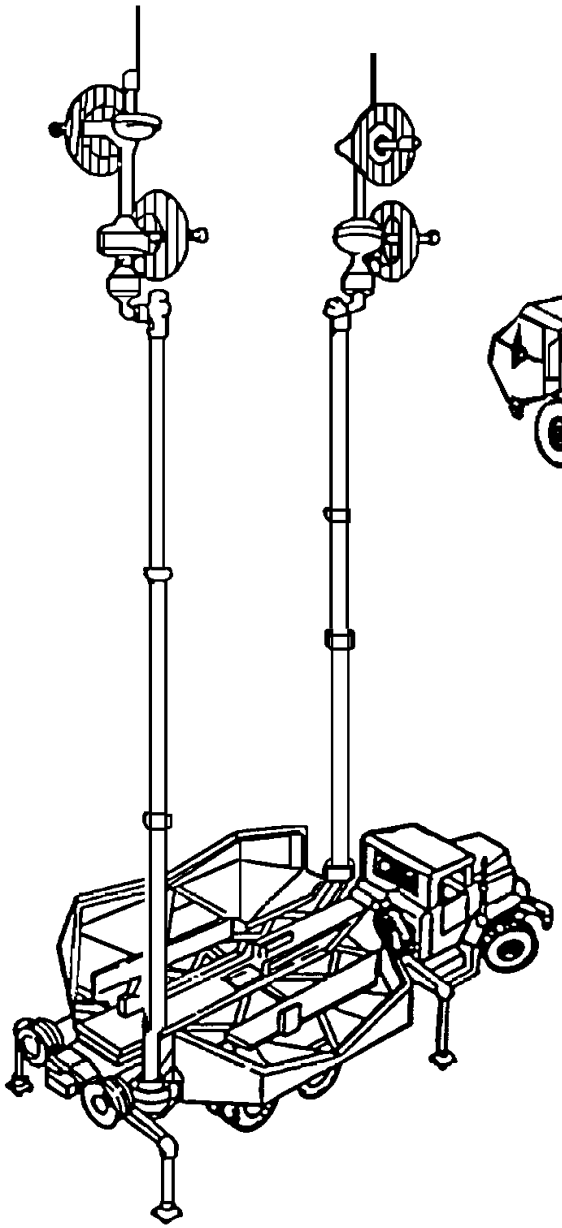
One of the essential tasks for the ground forces is to communicate indications and tactical information to air units. The number and size of these systems is unknown; however, the expectation is that they would be small enough to integrate into the Patriot sites. The U.S. Army and USAF are also requesting the battalion to support a number of experiments and tests, from command and control testing through joint air and missile doctrine development. As these are developing actions, it is unclear as to what size, composition, or makeup of people or equipment the testing community would provide. These experiment and testing requirements would follow the same environmental criteria and site selection limitations as the rest of the proposed ADA activities.

Patriot Battery Unit

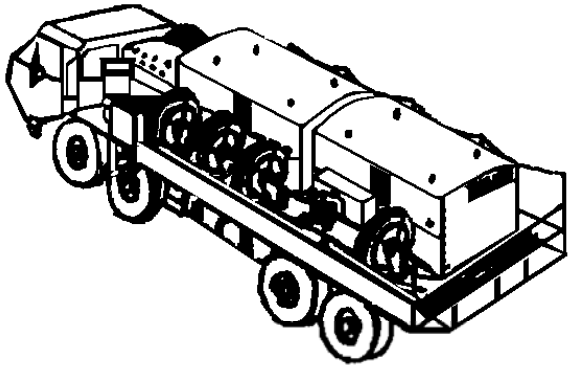
There are eight Patriot ADA sites that could be utilized during the proposed ADA activities. Each Patriot ADA site occupies an area of approximately one square kilometer, km^2 (approximately 250 acres) and would support approximately 32 vehicles and 85 soldiers. For the proposed ADA activities the U.S. Army intends to locate most if not all of the Patriot systems within a one-quarter km^2 (60 acre) section of the approved site. This is intended to reduce potential impacts to rangeland at the ADA site and to allow the unit commanders to exercise decision making skills in stationing equipment. Typical equipment at each site would include between six to eight launchers, a radar station, power plant/generator, control station, antenna masts, and other support equipment. If grounding rods are used during the proposed ADA activities they would be removed at the completion of the exercise. Figure 2-3 shows a typical Patriot Battery layout, types of equipment that would be located on each site, and the areas of potential disturbance. Each Patriot site would billet approximately 85 soldiers thereby requiring three to four tents, a mobile field kitchen, shower, and toilet facilities. Most of these facilities would be located just inside the entry point near the perimeter of the ADA site.

The perimeter of each of the proposed ADA sites would be established and delineated with flagging, exclusion tape, or snow fencing prior to emplacement to prevent the disturbance of adjacent habitat. No razor wire or concertina would be used. Ground disturbance would occur from vehicle traffic, grounding rods, and perimeter fencing. To minimize soil disturbance during the emplacement of equipment at the ADA site, vehicles would operate at reduced speeds and a single path would be utilized to position the launchers. Once in place the launchers would remain stationary and routine maintenance would be completed utilizing a high-mobility multipurpose wheeled vehicle (HMMWV) or similar vehicle. In addition, the entry control point would be located next to the closest access road and clearly identified with flagging or signage. Most of the activities at a Patriot site would be concentrated around the billeting and control stations and to and from the control, radar, and firing units. As a result, much of the area in front of the Patriot firing units and on the sides would be subject to minimal disturbance. The resulting pattern of disturbance would be hourglass-shaped with the heaviest potential disturbance located at the entry point spreading out towards the billeting and the control center, narrowing in by the power plant and radar unit, and fanning out again by the launchers. Based on the tactical scenario each Patriot Battery may relocate once during the proposed exercise.

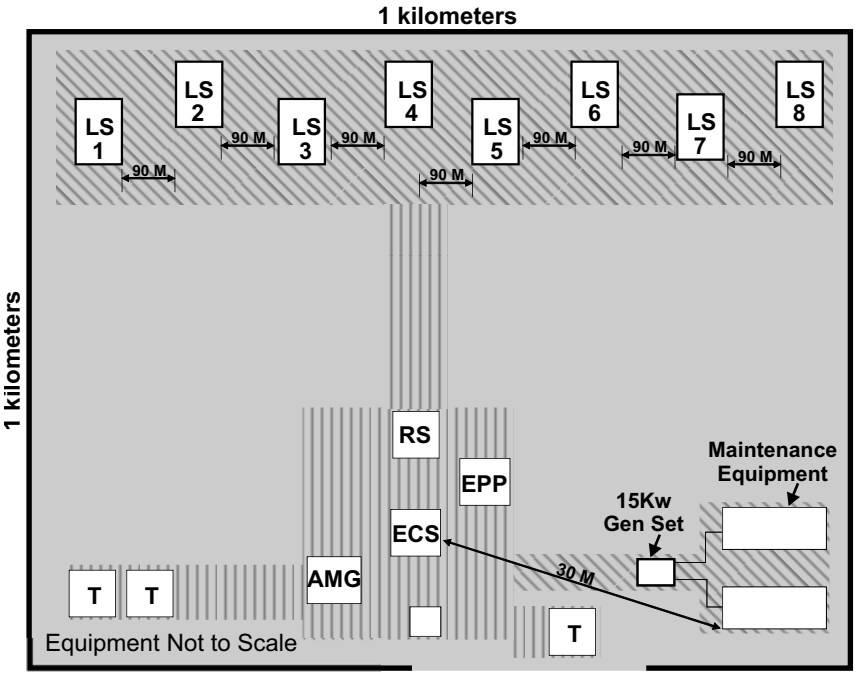
Antenna Mast Group



Electrical Power Plant

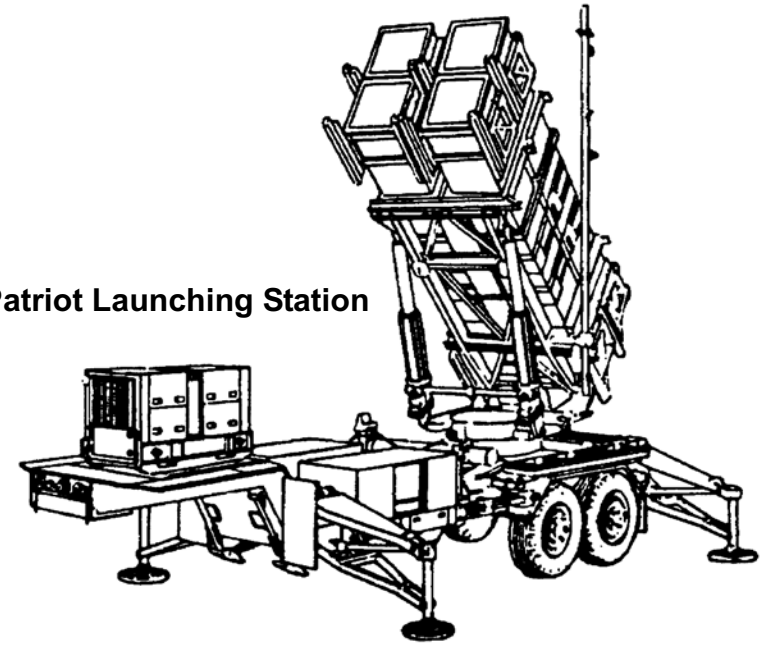


Patriot Site Diagram



LS = Launching Stations
RS = Radar Station
EPP = Electric Power Plant
ECS = Engagement Control Station
AMG = Antenna Mast Group
T = Tent
No Disturbance
Low to Medium Disturbance
Heavy Distrubance

Patriot Launching Station



Source: U.S. Army, 2004

Joint Red Flag '05 ADA Activities

Figure 2-3
Patriot Battery Unit

Mobile Avenger and Sentinel Sites

The Avenger unit consists of a single HMMWV with a turret mounted weapon system (Figure 2-4). While at their deployment sites, the Avenger units would attempt to electronically detect and defeat aggressor REDFOR units. This system is utilized for low-level aerial threats and reconnaissance, and plays an integral role in an ADA unit. Approximately six to eight Avenger units would participate in the proposed ADA activities.

The Sentinel System consists of a trailer-mounted radar system consisting of an antenna transceiver group mounted on a high-mobility trailer towed by a HMMWV (Figure 2-5). The unit is typically emplaced and operated by up to six soldiers. The role of the unit is to alert the CCC and other ADA teams of hostile and unknown aerial threats. The system also links other Patriot, Avenger, and Sentinel units electronically by both voice and electronic data streams.

The Avenger and Sentinel Systems would deploy to transient sites during the proposed ADA activities. These sites would contain one or two Avenger or Sentinel units or a rubber-tired communication vehicle. Transient sites would be utilized for no more than four hours and would be limited to within 50 meters (164 feet) of existing roads or trails. Mobile units would not leave existing roadways in areas identified as potential desert tortoise habitat. The transient sites do not include sandbag berms, kitchen, shower, or toilet facilities, but would have access to portable latrines in the vicinity for proper field sanitation. Mobile Avenger and Sentinel units would bivouac at the LSA or the approved Patriot sites.

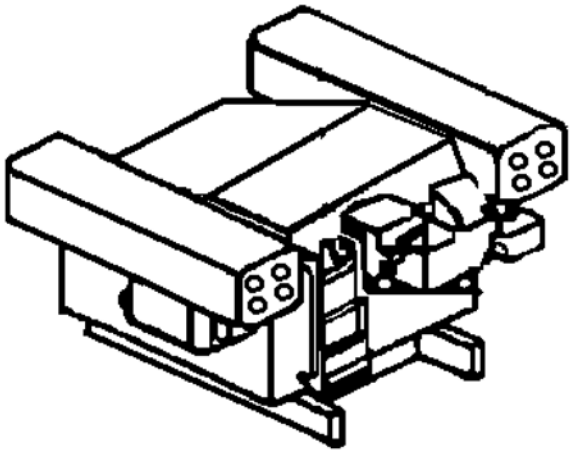
Based upon the tactical scenario, weather conditions, terrain, NTTR management restrictions, and required battlefield survivability, these units would move frequently during the proposed ADA activities. By using mobile/transient sites, the Avenger and Sentinel units would be able to move after each live fly exercise, allowing them the benefit of locating to a different terrain between exercises.

Each transient site would be identified by the environmental monitoring teams using GPS coordinates, and a monitoring checklist would be completed. This would enable the environmental monitoring teams to identify the site during the after action review.

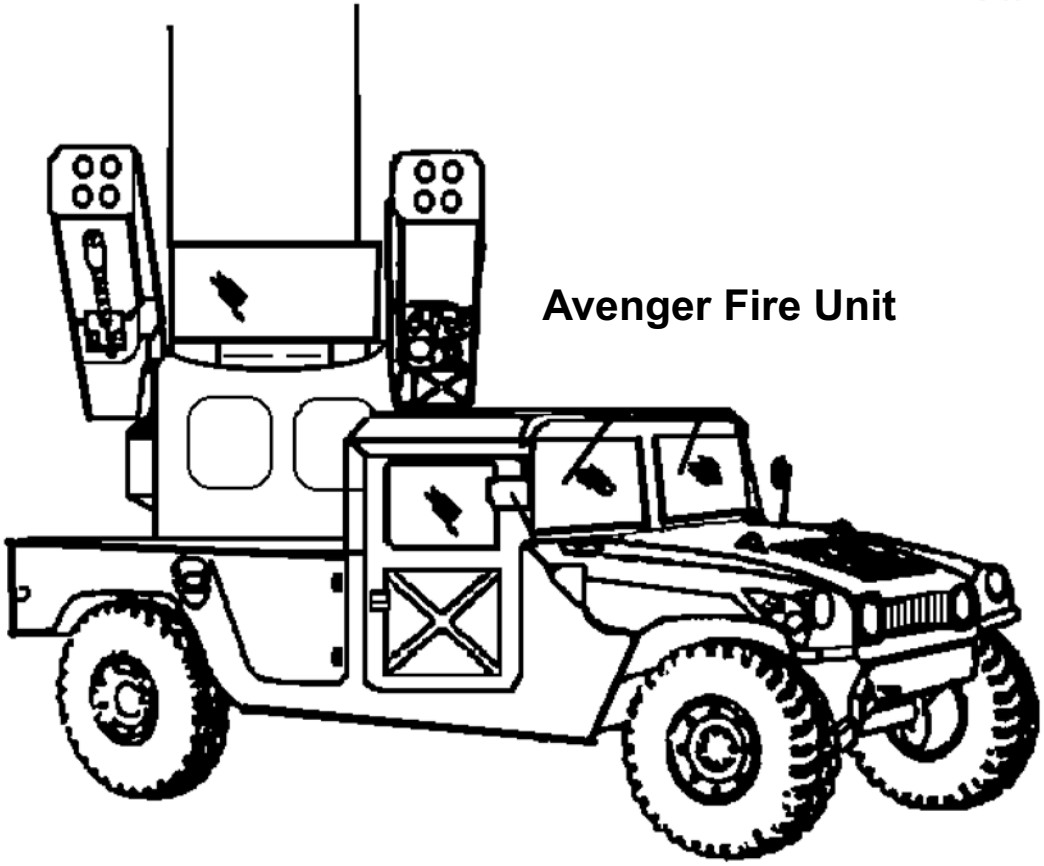
Logistic Support Area

In order to support the proposed ADA activities, the Alamo airfield, a private dirt landing field located approximately one mile west of the community of Alamo, would be used for logistics support to stage equipment and replenishments for the field units. All activities at this site would be restricted to the landing site and the perimeter of the area would be clearly identified by flagging or signage. Support vehicles and equipment would include approximately 20 to 25 heavy-duty cargo trucks, two fuel trucks, 12 to 15 light-duty utility trucks, and 4 to12 generators, depending on mission requirements. Access to and from the airfield would require travel through the town of Alamo and to the extent possible would only occur during daylight hours. Speeds would be limited to less than 20 mph on the

Standard Vehicle Missile Launcher



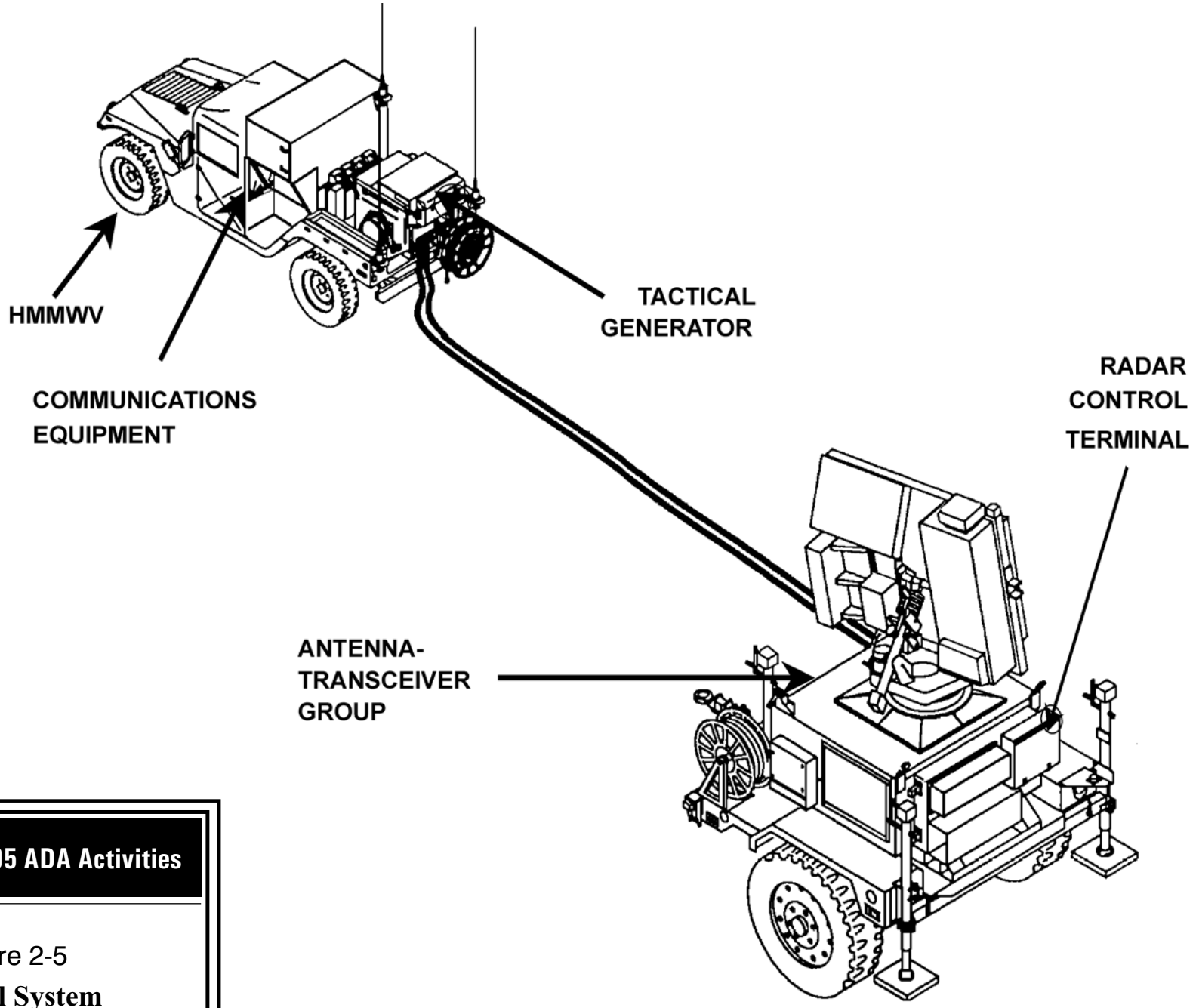
Avenger Fire Unit



Source: U.S. Army, 2004

Joint Red Flag '05 ADA Activities

Figure 2-4
Avenger System



Joint Red Flag '05 ADA Activities

Figure 2-5
Sentinel System

Source: U.S. Army, 2004

approved access road. Access to the LSA shall occur via Broadway/1st Street West/Airport Road. 1st Street South would not be used to access the LSA to minimize potential noise impacts to the Pahranagat Middle School. The route would be flagged and identified on all military maps prior to deployment. Replenishments would be sent from the Alamo airfield to the Patriot batteries as necessary. The location of the LSA would provide for the efficient movement of supplies to the field and would limit extensive vehicle travel to NAFB or other military facilities such as the Las Vegas or Tonopah Test Range Complexes.

Command and Control Center

The CCC is the operational command center for the proposed ADA activities. This site would act as the fire control center during the exercise and would direct the Patriot, Avenger, and Sentinel units in the field. The CCC would be located at the Patriot 3 site, which is located at the Caliente dirt airfield.

2.2.3 Exercise Review

At the conclusion of the exercise and demobilization of the ADA batteries, each site utilized during the proposed ADA activities would be inspected by the 2-43 Battalion environmental monitoring teams and representatives of the BLM. Each site would be photographed and the existing site conditions documented in After Action Reviews (AAR) prepared under the direction of the Battalion Maintenance Officer, who provides daily briefs to the Battalion Commander. If any damage, not consistent with the potential impacts identified in this EA, has occurred at a site, the unit commander would be notified and appropriate actions would be taken to restore the site in consultation with the BLM. Based on the recommendations of the BLM and the U.S. Army, the site would be restored as necessary to preclude continued degradation within one year of the exercise. Lessons learned from each exercise would be documented and incorporated into future procedures. The final copy of the overall Exercise AAR would be provided to the participating installations and to regulatory agencies through Red Flag and the 98th Range Wing.

2.3 MEASURES INCORPORATED IN THE PROPOSED ACTION TO REDUCE ENVIRONMENTAL IMPACTS

Several mechanisms have been incorporated into the proposed ADA activities that would reduce or avoid known potential impacts to sensitive resources. In addition to environmental criteria identified for the selection of each ADA site, the U.S. Army and USAF have developed SOPs that have been incorporated into the proposed ADA activities to minimize or avoid potential impacts.

Standard Operating Procedures

The following SOPs have been incorporated into the proposed ADA activities to reduce or eliminate potential significant environmental impacts:

- No tracked vehicles will be used. (Biology, Land Use, Water and Earth Resources)
- No earthen berms or foxholes will be constructed. (Biology, Land Use, Water and Earth Resources)
- No live or blank ammunition, or munitions simulators will be used. (General, Safety)

- The chain of command (i.e., U.S. Army) is responsible for each Avenger, Patriot, and Sentinel unit to ensure safety and environmental requirements/restrictions are being observed. The chain of command will approve each relocation by Avenger and Sentinel units, document any environmental violation, and coordinate with the U.S. Army and the BLM if reclamation is required upon completion of the ADA activities. (General, Biology, Water and Earth Resources, Land Use, Noise, Safety)
- U.S. Army ground-based units will use GPS to ensure they are located within proposed site boundaries. Proposed Patriot Battery bivouac areas will be clearly delineated on maps. (General, Biology, Water and Earth Resources, Land Use, Noise)
- The U.S. Army will ensure that vehicle engine idling shall be limited to the extent feasible. (Air Quality)
- To the extent feasible, the U.S. Army will ensure that vehicle speeds will remain below 20 mph on dirt roads to minimize dust and desert tortoise impacts. (Air Quality, Biology, Land Use)
- The U.S. Army will not dig at field sites. Vegetation will not be cleared at these sites. Outriggers will be installed to stabilize equipment platforms. If fences are cut they shall be repaired when the company leaves the area. Any gates opened to allow large vehicles to pass will be closed immediately. (Biology, Water and Earth Resources, Cultural, Land Use, Safety)
- The U.S. Army, U.S. Army Corps of Engineers (USACE), and BLM will conduct pre- and post-exercise inspection for environmental and cultural resources at the Patriot Battery sites. Photo documentation of each site would occur for pre- and post-exercise activities to document site conditions. (Biology, Water and Earth Resources, Cultural, Land Use, Safety)
- The USACE will flag populations of noxious weeds identified by the BLM in the Dry Lake Valley. These sites would be flagged for avoidance prior to the proposed ADA activities. (Biology, Land Use)
- The U.S. Army shall ensure that all vehicles and heavy equipment used for the proposed ADA activities authorized for off-road driving that contact plant species listed on the Nevada Noxious Weed list or specifically identified by the BLM Ely Field Office would be cleaned prior to continued use in weed-free areas. (Biology, Land Use)
- The U.S. Army shall present a tortoise-education program to all personnel who may encounter desert tortoise during the exercise. (General, Biology)
- Prior to conducting ADA activities, the U.S. Army will have the LSA site cleared by a qualified tortoise biologist. (Biology)
- The U.S. Army will have a qualified tortoise biologist periodically inspect the sites (LSA and Alamo Canyon Access Road) during the ADA activities to ensure desert tortoise has not moved onto the site. (Biology)
- If desert tortoise or signs of desert tortoise are observed, the observation shall be reported to the designated U.S. Fish and Wildlife Service (USFWS) field contact representative. (Biology)
- Activities that may endanger a tortoise will cease if a tortoise is found in harms way as a result of the exercise. ADA activities will resume after the authorized biologist removes the tortoise from danger, the activity will avoid the tortoise, or after the tortoise has moved to a safe area. (Biology)
- Tortoises found in harms way shall be captured and relocated to undisturbed desert within two miles from the site found by an authorized desert tortoise biologist according to current approved protocol. Tortoises shall be deliberately moved solely for the purpose of moving them out of harms way. (Biology)
- The U.S. Army will police trash and debris at all sites daily, and store waste in sealed containers. (Biology, Safety)
- Sites found to have experienced environmental damage requiring restoration will be restored by the U.S. Army as soon as practicable after the ADA activities are completed. Restoration methods, if required, will be determined in consultation between the U.S. Army and the BLM. (Biology, Land Use)
- ADA sites shall not be used if ponded or flowing water is present. (Biology, Water and Earth Resources)

- Gray water will not be disposed of on public lands (43 CFR 8365.1-1). (Water and Earth Resources)
- Ground-based personnel involved in the ADA activities shall remain at least a quarter of a mile from any known riparian water source. (Biology, Water Resources, Safety)
- NAFB will notify rancher permittees, who are scheduled to graze cattle in the vicinity of the proposed ADA sites, prior to the initiation of the proposed ADA activities. (Land Use)
- The U.S. Army will place drip pans under all parked vehicles to avoid contaminating soils. (Water and Earth Resources, Safety)
- The U.S. Army will prepare spill prevention and response plans for all field sites, and locate emergency response equipment at Patriot sites and the LSA. If a hazardous waste spill occurs, contaminated soils will be contained and the 2-43 Battalion environmental monitoring team notified. Contaminated soils will be removed by the U.S. Army to an approved disposal site. Disposal of hazardous wastes will be in compliance with applicable laws and regulations. (Water and Earth Resources, Safety)
- The U.S. Army will make Material Safety Data Sheets readily available to all personnel at the various sites. (Safety)

2.4 ALTERNATIVES TO THE PROPOSED ACTION

2.4.1 Alternative A: No Action Alternative

Under the No Action Alternative, the U.S. Army ADA activities during the Joint Red Flag '05 (JRF-05) Exercise would not take place. This alternative would result in the loss of realistic ground-to-air combat condition training, theater coordination, and delay system upgrades to Patriot, Avenger, and Sentinel Systems. As a result, combat readiness could be adversely affected during a time of ongoing military conflict. Continuous training on Avenger, Patriot, and Sentinel Systems is required to maintain combat readiness and to refine response time, accuracy, and alertness. New developments in various components of weapons systems also require constant training. Continuous training is in demand as new troops are enlisted and/or others are promoted, transferred, or deployed. Under the No Action Alternative troop readiness would suffer and some military units may not meet the operational requirements required prior to foreign deployment. Implementation of the No Action Alternative would have no additional impact on environmental resources.

2.4.2 Alternative B: Reduced Scope of Exercise

Implementation of Alternative B would reduce the total number of personnel and equipment participating in the proposed ADA activities. However, activities at each of the proposed ADA sites would be similar to those conducted under the proposed ADA activities.

2.4.3 Alternative C: Elimination of Potential ADA Sites

Implementation of Alternative C would reduce the total number of ADA sites utilized during the proposed ADA activities. However, activities at each of the ADA sites would be similar to those identified under the proposed ADA activities.

2.5 ALTERNATIVES CONSIDERED AND ELIMINATED FROM FURTHER STUDY

Several alternatives were assessed for their potential to reasonably achieve the project objectives and reduce potential environmental impacts of the proposed ADA activities. Also, their technical and

regulatory feasibility was evaluated. Based on these screening criteria, the alternatives listed below were eliminated from further consideration. The following discussions describe these potential alternatives and the basis for their elimination.

2.5.1 Alternative Time Period

Under this alternative, the proposed ADA activities would be scheduled to occur during another time period. Red Flag Exercise's are operated on a schedule to allow both the U.S. military and its allies the opportunity to schedule troops for rotation to participate in this Exercise, budget funds for deployment, and to provide a realistic training environment. The JRF-05 Exercise is sponsored by the JNTC and the Joint Forces Command to take advantage of several other exercises occurring during this time period throughout the United States, such as the Roving Sands '05 Exercise which occurs at Fort Bliss, Texas. These exercises are to be electronically linked for a large scale joint exercise. Scheduling the proposed ADA activities during another Red Flag would diminish the value of the overall joint exercise.

2.5.2 Simulated Exercises

Under this alternative, the proposed ADA activities would be conducted utilizing simulators with no field deployment of troops or equipment. Currently, ADA units routinely utilize electronic simulators as an integral component to battlefield training, but require field mobilization to simulate real-world battlefield conditions. Conducting training as a completely simulated exercise, with no field deployment, would seriously limit the effectiveness of the proposed ADA activities as a tool to develop functional integration of forces and would not meet the purpose and need of the proposed ADA activities. To maintain combat effectiveness and train both U.S. Army and USAF personnel, it is critical that U.S. Army Avenger, Patriot, and Sentinel units have an opportunity to conduct a portion of their training in as realistic a combat setting as possible to ensure proper training of forces.

2.6 COMPARISON OF ALTERNATIVES

Table 2-1 summarizes the environmental impacts of the proposed action and alternatives in comparative form. Detailed descriptions of impacts are presented by resource in Section 4.

Table 2-1. Comparison of Alternatives

	Level of Impact			
Resource	**Proposed Action**	**Alt A No Action**	**Alt B Reduced Scope**	**Alt C Elimination of ADA Sites**
Air Quality	The emissions for the proposed ADA activities are estimated to be: Oxides of Nitrogen (NOx) – 2.99 tons Carbon Monoxide (CO) – 0.58 tons Volatile Organic Compounds (VOC) – 0.15 tons Oxides of Sulfur (SOx) – 0.03 tons Fine Particulate Matter (PM_{10}) – 20.52 tons Additionally, the estimated emissions within Clark County are below the General Conformity 70 and 100 ton *de minimus* emission thresholds for PM_{10} and CO, respectively.	No additional impacts to air quality would occur.	Similar but reduced air quality impacts as the proposed ADA activities. The Exercise emissions for this alternative are estimated to be: NOx – 1.67 tons CO – 0.34 tons VOC – 0.09 tons SOx – 0.02 tons PM10 – 10.34 tons	Similar but reduced air quality impacts as the proposed ADA activities. The Exercise emissions for this alternative are estimated to be: NOx – 2.74 tons CO – 0.54 tons VOC – 0.14 tons SOx – 0.03 tons PM10 – 15.65 tons
Biological Resources	ADA activities could result in temporary impacts to existing vegetation, wildlife, and sensitive species. Project could also result in temporary loss of grazing habitat. Riparian and wetland habitat would be avoided. Impacts to biological resources and sensitive wildlife species including desert tortoise would be avoided through be incorporation of site selection criteria and SOPs.	No additional impacts to biological resources would occur.	Potential impacts to biological resources would be similar to the proposed ADA activities.	Impacts to biological resources may be potentially reduced by the elimination of some sites.
Water Resources	Impacts to surface and groundwater could occur from fuel leaks, spills or the disruption of soils. Impacts would be reduced through SOPs and site selection criteria.	No additional impacts to water resources would occur.	Similar but reduced impacts to water resources compared to the proposed ADA activities.	Impacts would be potentially reduced through the elimination of some sites.
Earth Resources	Impacts to geological resources could occur from soil disturbance. Impacts would be reduced through SOPs and site selection criteria.	No additional impacts to geological resources would occur.	Similar but reduced impacts to geological resources compared to the proposed ADA activities	Impacts would be potentially reduced through the elimination of some sites.
Land use	Land use impacts could include a temporary change of grazing land to military use and conflicts with sensitive land use receptors.	No additional impact to existing land uses would occur.	Similar but reduced impacts to existing land uses compared to the proposed ADA activities.	Similar but reduced impacts to existing land uses compared to the proposed ADA activities.
Aesthetics	The project would not conflict with BLM land use designations.	No impact to visual resources would occur.	No impact to visual resources would occur.	No impact to visual resources would occur.

	Level of Impact			
Resource	**Proposed Action**	**Alt A No Action**	**Alt B Reduced Scope**	**Alt C Elimination of ADA Sites**
Recreation	Temporary impacts could occur to recreational users during the exercise. No impact to recreational facilities would occur.	No additional impact to recreational resources would occur.	Similar but reduced impacts to recreational resources compared to the proposed ADA activities.	Similar but reduced impacts to recreational resources compared to the proposed ADA activities.
Noise	Noise impacts could include vehicle traffic and ADA ground activities. Sensitive receptors were identified near the LSA (town of Alamo). Impacts to residences would be reduced through implementation of SOPs and site selection criteria.	No noise impacts would occur.	Noise impacts would be similar to the proposed ADA activities.	Noise impacts would be similar to the proposed ADA activities.
Socioeconomics	Implementation of the proposed ADA activities would neither place a demand on employment opportunities, housing, or public facilities, nor would it create new employment opportunities, housing, or public facilities in the region	Socioeconomic impacts to communities in the proposed ADA activities region would not occur.	Socioeconomic impacts would be similar to impacts under the proposed ADA activities and not significant.	Socioeconomic impacts would be similar to impacts under the proposed ADA activities and not significant.
Transportation	Traffic would temporarily increase during deployment, operations, and demobilization phases. Impacts would be reduced by scheduling the convoy to avoid traveling in urban areas (i.e., North Las Vegas) during peak traffic hours. Implementation of the proposed ADA activities would not require the closure of any roadways, would not substantially disrupt current transportation patterns and systems, would not degrade existing levels of service, would not limit access to or from adjacent land uses, and would not restrict emergency vehicle access.	No transportation impacts would occur.	Transportation impacts would be similar to impacts under the proposed ADA activities.	Impacts to back country roads would be potentially reduced, as fewer sites would be accessed.
Hazardous Materials and Waste Handling and Disposal	Safety impacts would be less than significant with implementation of prescribed doctrinal procedures and SOPs. Safety risks from hazardous materials would be reduced through established hazardous materials and waste management practices and spill prevention, control, and countermeasures procedures employed at participating military installations to preclude adverse impacts.	No new safety issues would exist, and no hazardous materials would be required. No additional impacts would occur.	Safety and hazardous materials issues would be similar to the proposed ADA activities.	The potential area of impact would be reduced compared to the proposed ADA activities.
Cultural Resources	Implementation of the proposed ADA activities would avoid all known cultural resources in the project area. Potential sites including isolates and lithic scatters would be flagged for avoidance and not impacted by vehicles or equipment.	No impacts to cultural resources would occur.	Potential impacts to cultural resources would be similar to the proposed ADA activities.	Potential impacts to cultural resources would be similar to the proposed ADA activities.

	Level of Impact			
Resource	**Proposed Action**	**Alt A No Action**	**Alt B Reduced Scope**	**Alt C Elimination of ADA Sites**
Utilities	No utilities would be impacted during the proposed ADA activity. Underground utilities would not be disrupted, as no digging would occur at any of the sites; overhead utilities would not be affected, as none of the equipment involved in the proposed ADA activities would exceed clearance requirements; and no "tapping" into existing utilities would occur, as generators would be provided.	No impact to utilities would occur.	No impact to utilities would occur. Impacts would be similar to the proposed action.	No impact to utilities would occur. Impacts would be similar to the proposed action.

3.1 AIR QUALITY

This chapter describes the existing conditions in the region of the proposed ADA activities. These conditions provide the baseline for the assessment of environmental impacts from the proposed ADA activities and alternatives.

3.1.1 Existing Conditions

Climate and Factors Affecting Air Quality

The proposed ADA activities would mobilize from NAFB in Clark County and the proposed ADA sites would be distributed throughout a large area within Lincoln County. The entire ADA activity area includes a large portion of Lincoln County which is at the boundary of the northern Mojave Desert and the southern Great Basin, and Clark County within and north of the Las Vegas Valley.

From fall through spring, during which time the proposed ADA activities are scheduled to occur, the climate of the area is mainly influence by Pacific air movements that come across the Sierra Nevada Mountains. Overall, due to high insolation during most of the year the dispersion characteristics are good to fair. However, during the period of the proposed ADA activities, the area can exhibit poor vertical and horizontal dispersion characteristics, which limit the dispersion of emissions and cause increased ambient air pollutant concentrations near the ground surface. Persistent surface-based temperature inversions during the cold weather months can limit vertical dispersion of air pollutants by acting as a "ceiling" that prevents pollutants from rising and dispersing. Mountain ranges can also act as "walls" that inhibit horizontal dispersion of air pollutants within valleys. Calm wind conditions, which occur during winter inversions, may also limit pollutant dispersion during the period of the scheduled ADA activities, particularly during nighttime and early morning hours. The dispersion characteristics of each proposed ADA site within Lincoln County will be affected by the general topography surrounding the ADA site and the ambient conditions that occur at each ADA site during the proposed ADA activities.

Monitoring stations in North Las Vegas and the Key Pittman Wildlife Management Area (WMA) were selected to represent the average climate of the southern and northern portions of the study area, respectively. The North Las Vegas weather station is located near NAFB, from which the ADA activities would be mobilized. The Key Pittman WMA is located in Lincoln County in the general area of the proposed ADA sites. As described in Table 3.1-1, average March high and low temperatures in the North Las Vegas area are 72.2°F (22.3°C) and 42.4°F (5.8°C), respectively, while the average March high and low temperatures at the Key Pittman WMA are 62.2°F (16.8°C) and 31.2°F (-0.4°C), respectively. Annual precipitation averages in North Las Vegas and at the Key Pittman WMA are 4.19 inches (10.64 cm) and 7.94 inches (20.17 cm), respectively.

Table 3.1-1: Monthly Temperature and Precipitation in the ADA Activity Area

Month	North Las Vegas						Key Pittman WMA					
	Temperature				Precipitation		Temperature				Precipitation	
	Maximum		Minimum				Maximum		Minimum			
	° F	° C	° F	° C	inch	cm	° F	° C	° F	° C	inch	cm
January	60.2	15.7	32.2	0.1	0.58	1.47	50.4	10.2	23.9	-4.5	0.63	1.60
February	64.3	17.9	35.8	2.1	0.75	1.91	57.2	14.0	28.4	-2.0	0.81	2.06
March	72.2	22.3	42.4	5.8	0.49	1.24	62.2	16.8	31.2	-0.4	0.86	2.18
April	80.7	27.1	49.3	9.6	0.19	0.48	68.6	20.3	36.1	2.3	0.69	1.75
May	90.1	32.3	57.4	14.1	0.09	0.23	80.4	26.9	44.4	6.9	0.53	1.35
June	100.4	38.0	64.9	18.3	0.08	0.20	91.2	32.9	53.0	11.7	0.29	0.74
July	105.8	41.0	71.4	21.9	0.37	0.94	96.0	35.6	59.4	15.2	0.86	2.18
August	104.3	40.2	70.8	21.6	0.29	0.74	94.1	34.5	58.9	14.9	0.72	1.83
September	97.6	36.4	62.6	17.0	0.34	0.86	85.7	29.8	51.0	10.6	0.73	1.85
October	84.5	29.2	50.2	10.1	0.26	0.66	75.2	24.0	41.6	5.3	0.52	1.32
November	68.4	20.2	37.6	3.1	0.40	1.02	60.0	15.6	30.8	-0.7	0.60	1.52
December	59.9	15.5	31.5	-0.3	0.34	0.86	53.6	12.0	25.0	-3.9	0.69	1.75
Annual*	82.4	28.0	50.5	10.3	4.19	10.64	72.9	22.7	40.3	4.6	7.94	20.17

Source: WRCC, 2004
Note: The period of record for the North Las Vegas Station is from February 1, 1951 through June 30, 2004, and the period of record for the Key Pittman WMA station is from March 1, 1964 to June 28, 1989.
*Annual average temperature or annual total precipitation.

3.1.2 Air Quality Standards

The quality of surface air is evaluated by measuring ambient concentrations of pollutants that are known to have deleterious effects. Federal and state agencies then compare the degree of air quality degradation to the ambient air quality standards established. The air pollutants that are regulated by these standards are called "criteria pollutants." The current National Ambient Air Quality Standards (NAAQS or National Standards) and State Ambient Air Quality Standards (Nevada Standards) are listed in Table 3.1-2. Healthy adults can tolerate occasional exposure to air pollutant concentrations above the standards listed in Table 3.1-2 before adverse effects are observed.

Air quality standards are designed to protect those people most susceptible to further respiratory distress, such as asthmatics, the elderly, young children, people already weakened by other disease or illness, and people engaged in strenuous work. Table 3.1-3 provides a summary of potential health effects associated with the major criteria air pollutants.

3.1.3 Monitoring Data

Indications of existing criteria pollutant levels in and around the proposed ADA sites within Lincoln County cannot readily be determined as no regulatory ambient air monitoring stations currently exist anywhere within Lincoln County. However, Lincoln County is designated as unclassifiable/attainment for all ambient air quality standards. Recent monitoring data from Clark County, near the location of ADA activities mobilization, and the ADA activities southern end of the transportation route were obtained from the Clark County Department of Air Quality Management (CCDAQM). Two monitoring stations located in North Las Vegas (E. Craig Road Station) and Apex Nevada (for pollutants not monitored at the E. Craig Road Station) were selected to provide a general profile of the air quality near

NAFB, and the Mesquite Nevada station was selected to provide a general profile of the air quality north of the Las Vegas Valley. Ozone (O_3), carbon monoxide (CO), particulate matter under 10 microns (PM10), and particulate matter under 2.5 microns (PM2.5) are monitored at the North Las Vegas station, and nitrogen dioxide (NO_2) and sulfur dioxide (SO_2) are monitored at the Apex station. Only ozone, NO_2, and PM10 are monitored at the Mesquite station. Table 3.1-4 provides the monitoring data collected from the subject monitoring stations from 2001 to 2003.

Table 3.1-2: National and State Ambient Air Quality Standards

Pollutant	Averaging Time	Nevada Standards[1]	National Standards[2]	
		Concentrations[3]	Primary[3,4]	Secondary[3,5]
Ozone (O_3)	1-hour 8-hour [6]	0.12 ppm (235 µg/m^3) NS	0.12 ppm (235 µg/m^3)[6] 0.08 ppm (157 µg/m^3)	0.12 ppm (235 µg/m^3) NS
Carbon Monoxide (CO)	1-hour 8-hour [8] 8-hour [9]	35 ppm (40 mg/m^3) 9.0 ppm (10 mg/m^3) 6.0 ppm (6.67 mg/m^3)	35 ppm (40 mg/m^3) 9 ppm (10 mg/m^3)	NS NS
Nitrogen Dioxide (NO_2)	Annual Avg.	0.053 ppm (100 µg/m^3)	0.053 ppm (100 µg/m^3)	0.053 ppm (100 µg/m^3)
Sulfur Dioxide (SO_2)	3-hour 24-hour Annual Avg.	0.5 ppm (1300 µg/m^3) 0.04 ppm (105 µg/m^3) 0.03 ppm (80 µg/m^3)	NS 0.14 ppm (365 µg/m^3) 0.03 ppm (80 µg/m^3)	0.5 ppm (1300 µg/m^3) NS NS
Respirable Particulate Matter (PM10)	24-hour Ann. Arith. Mean	150 µg/m^3 50 µg/m^3	150 µg/m^3 50 µg/m^3	150 µg/m^3 50 µg/m^3
Fine Particulate Matter (PM2.5)[6]	24-hour Ann. Arith. Mean	NS NS	65 µg/m^3 15 µg/m^3	NS NS
Lead (Pb)	Calendar Qtr.	1.5 µg/m^3	1.5 µg/m^3	1.5 µg/m^3
Hydrogen Sulfide [7]	1-hour	0.08 ppm (112 µg/m^3)	NS	NS

Source: NDEP, 2004a.

Notes: NS=no standard; ppm=parts per million; $\mu g/m^3$=microgram per cubic meter; mg/m^3=milligrams per cubic meter

1. Nevada Standards are values that are not to be exceeded in areas where the public has access.
2. National Standards, other than ozone, fine particulate matter (PM2.5), and those based on annual averages or annual arithmetic mean, are not to be exceeded more than once a year. The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar). Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
5. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any know or anticipated adverse effects of a regulated air pollutant.
6. National 8-hour ozone and fine particulate matter standards were promulgated by the United States Environmental Protection Agency on July 18, 1997 and designation of attainment/nonattainment for these standards was completed in 2004. The national 1-hour ozone standard continues to apply in areas that violated the standard.
7. The Nevada ambient air quality standard for hydrogen sulfide does not include naturally occurring background concentrations.
8. Applies at elevations less than 5000 feet above mean sea level.
9. Applies at elevations equal to or greater than 5000 feet above mean sea level.

Table 3.1-3: Summary of Health Effects of the Major Criteria Pollutants

Air Pollutant	Adverse Effects
Ozone	Eye irritation Respiratory function impairment Aggravation of respiratory and cardiovascular diseases
Carbon Monoxide	Impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin Aggravation of cardiovascular disease Impairment of central nervous system function Fatigue, headache, confusion, dizziness Death at high levels of exposure Aggravation of some heart diseases (angina)
Nitrogen Dioxide	Risk of acute and chronic respiratory disease
Suspended Particulates	Increased risk of chronic respiratory disease Reduced lung function With SO_2, may produce acute illness Particulate matter 10 microns or less in size (PM_{10}) may lodge in and/or irritate the lungs

Source: SCAQMD, 1993.

Table 3.1-4: Ambient Air Quality Summary

Pollutant	North Las Vegas/Apex			Mesquite[1]		
	2001	2002	2003	2001	2002	2003
Ozone (1-Hour)						
Max. Concentration (ppm)	0.102	0.097	0.111	0.062	0.091	0.085
Days>NAAQS (0.125 ppm)	0	0	0	0	0	0
Ozone (8-Hour)						
Max. Concentration (ppm)	0.078	0.089	0.089	0.056	0.076	0.080
Days>NAAQS (0.085 ppm)	0	1	1	0	0	0
CO (1-Hour)						
Max. Concentration (ppm)	3.5	2.3	1.5	NA	NA	NA
CO (8-Hour)						
Max. Concentration (ppm)	2.4	1.8	0.9	NA	NA	NA
NO_2 (Annual)						
Annual Concentration (ppm)	0.0065	0.0084	0.0069	NA	0.0101	0.0093
PM10 (24-Hour)[2]						
Maximum Concentration ($\mu g/m^3$)	151	535	230	44	413	254
Days > NAAQS (150 $\mu g/m^3$)	0/340	3/346	1/344	0/56	4/328	1/348
PM10 (Annual)						
Annual Concentration ($\mu g/m^3$)	43.0	50.3	45.8	23.1	33.2	26.1
PM2.5 (24-Hour)						
Max. Concentration ($\mu g/m^3$)	NA	NA	47	NA	NA	NA
PM2.5 (Annual)						
Annual Concentration ($\mu g/m^3$)	NA	NA	13.5	NA	NA	NA
SO_2 (1-Hour)						
Max. Concentration (ppm)	0.014	0.007	0.010	NA	NA	NA
SO_2 (3-Hour)						
Max. Concentration (ppm)	0.005	0.006	0.006	NA	NA	NA
SO_2 (24-Hour)						
Max. Concentration (ppm)	0.002	0.002	0.002	NA	NA	NA

Source: CCDAQM, 2004a.

Notes: ppm=parts per million; $\mu g/m^3$=micrograms per cubic meter; NAAQS=National Ambient Air Quality Standard; NA=not available.

1. Apex station data for NO_2 and SO_2, data otherwise from North Las Vegas station.
2. "Days" for PM10 are given as exceedances/number of annual measurements

During the three-year period for the specified North Las Vegas stations there were a couple of recorded exceedances of the 8-hour ozone standard and a total of four recorded exceedances of the 24-hour PM10 standard, which were likely the result of wind blown dust storm events. During the same period for the Mesquite station there were no recorded exceedances of the ozone standards and five total recorded exceedances of the 24-hour PM10 standard, again likely due from wind blown dust storm events. The air quality in the remote areas for the proposed ADA sites in Lincoln County would be expected to be significantly better than that measured in Clark County.

3.1.4 Air Quality Attainment Status

Non-attainment is a term used to indicate violations of an air quality standard (Table 3.1-2). A summary of the air quality status in Lincoln and Clark Counties relative to meeting the NAAQS is provided in Table 3.1-5. As shown in Table 3.1-5, air quality in Lincoln County and the northern portion of Clark County adjacent to Lincoln County are designated as unclassifiable/attainment for all criteria pollutants. The air quality for the Las Vegas portion of Clark County, including the portions of NAFB that would be used for ADA activity mobilization, is designated as serious nonattainment for both the CO and PM10 NAAQS and basic non-attainment for the 8-hour ozone NAAQS.

Table 3.1-5: Attainment Status of the Study Area

Pollutant	Lincoln County and Clark County (North of Las Vegas)	Clark County (Las Vegas Area)
Ozone 1-hour	Unclassifiable/Attainment	Unclassifiable/Attainment
Ozone 8-hour	Unclassifiable/Attainment	Basic Nonattainment
CO	Unclassifiable/Attainment	Serious Nonattainment
PM10	Unclassifiable/Attainment	Serious Nonattainment
NO_2, SO_2, & PM2.5	Unclassifiable/Attainment	Unclassifiable/Attainment

Source: USEPA, 2004a.

The General Conformity Rule (40 CFR Part 93, Subpart B) addresses both non-attainment areas and maintenance areas (former non-attainment areas now in attainment). Lincoln County and Clark County, north of the Las Vegas nonattainment area, are neither non-attainment areas nor maintenance areas for any criteria pollutants, so General Conformity does not apply to those areas. But, the Las Vegas area of Clark County is designated as a serious non-attainment area for PM10, a serious non-attainment area for CO, and a basic non-attainment area for ozone (8-hour standard). For general conformity, prior to June 15, 2005 the current 1-hour ozone NAAQS area designation applies for the ADA activities' conformity determination rather than the 8-hour designation (USEPA, 2003 and 2004b).

While the Las Vegas area is still designated as a serious CO nonattainment area there has not been a violation of the CO NAAQS for over three years and the Las Vegas area will be designated as a CO maintenance area after a CO maintenance plan is submitted by CCDAQM and approved by the United States Environmental Protection Agency (USEPA).

3.2 BIOLOGICAL RESOURCES

This section describes the current biological conditions observed in the proposed ADA activity area and is based on the following information:

- Species known to occur within the ADA activity area, based on historic range and field observations
- Species likely to occur within the ADA activity area, based on the distribution of the species and habitat suitability
- Species that could be affected by the proposed ADA activities, because of their presence in areas adjacent to the proposed ADA activity area
- Renewal of the Nellis Air Force Range (NAFR) Land Withdrawal Department of the Air Force Environmental Impact Statement (USAF, 1999a)
- Integrated Natural Resource Management Plan for Nellis Air Force Base/Air Force Range (USAF, 2001)

Lists of plant and animal species considered in this analysis were based upon:

- Reconnaissance surveys conducted in the ADA activity area by USACE-contracted Biologists from 15-17 October 2004 and 21-22 December 2004;
- USFWS List of Sensitive Species with the potential to occur in the proposed ADA activity area, which is provided in Appendix B (USFWS, 2005);
- Nevada Natural Heritage Program list of Sensitive taxa recorded near the proposed ADA activity area (NNHD, 2004); and
- Biological information provided by the Nevada Department of Wildlife (NDOW, 2004a, 2004b, 2004c).

3.2.1 Existing Conditions

This section describes the existing biological resources that occur in the region of the proposed ADA activities and the site specific conditions identified at each of the proposed ADA sites. The proposed ADA activity area is located in the transition zone between the northern Mojave Desert and the southern Great Basin. Although a small portion of the ADA activity area has characteristics of the Mohave Basin, most of the vegetation is more similar to that of the Great Basin. In this region, rainfall totals are often less than four inches per year and results in a dry to moderately dry climate with cold winters and hot summers (USAF, 2001). The adjacent mountain ranges including the Delamar Mountains, Pahroc and Seamans Ranges can receive snow during cold winter storms while the more southern areas can receive much of the annual rainfall during the summer months for short but intense periods of time as a result of periodic monsoons. Except in the driest years, climatic conditions generally support perennial flows in the Pahranagat Valley and White River. Although extremely small in total area, riparian and lacustrine communities in this region support large numbers of species including 80 percent of the regions birds (Dobkin, 1996).

3.2.2 Vegetation

The proposed ADA activities would be located in an area that encompasses approximately 2.5 million acres of land which occur in the transitional zone between the Mojave Desert and Great Basin biogeographic provinces. Plant communities in this region are characterized by Mojave Desert Scrub and Great Basin Desert Scrub biomes (Brown, 1994). For most of the region, the availability of water

or soil moisture is the critical factor that determines the distribution of vegetation types and associated wildlife species. A description of the dominant plant communities located in the region is described below.

Mojave Desert Scrub Biome

Mojave Desert Scrub communities occur to a limited extent in the proposed ADA activity area and are primarily located east of the community of Alamo near Eight Mile Valley. This region is the most northern extent of the Mojave Basin biogeographic province and is dominated by creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), range ratany (*Krameria erecta*), cheesebush (*Hymenoclea salsola*), Mormon tea (*Ephedra* spp.), and spiny menodora (*Menodora spinescens*). Four-wing saltbrush (*Atriplex canescens*), joint-fir (*E.nevadensis*), budsage (*A. spinescens*), and Joshua tree (*Yucca brevifolia*) are other common elements observed in these communities. Although not the dominant vegetative cover, Joshua trees formed a conspicuous element at several locations in the proposed ADA activity area. Cacti were also well represented region wide and include silver cholla (*Opuntia echinocarpa*), old man cactus (*O. erinacea*), and beavertail (*O. basilaris*). Strawberry hedgehog cactus (*Echinocereus engelmannii*) is also present but to a limited extent.

Herbaceous annual species identified in the proposed ADA activity area included desert mallow (*Sphaeralcea ambigua*), desert trumpet (*Eriogonum inflatum*), Mojave buckwheat (*E. fasciculatum*), Mojave aster (*Xylorhiza tortifolia*), blue flax (*Linum perenne*), and princes plume (*Stanleya pinnata*). Native perennial grasses, including Indian rice grass (*Oryzopsis hymenoides*), big galletta (*Hilaria rigida*), and fluffgrass (*Erioneuron pulchellum*) were also present. Non-native grasses and invasive herbaceous plants occur to a limited extent in most of the proposed ADA activity area and include cheatgrass (*Bromus tectorum*) and red brome (*B. madritensis ssp. rubens*). Other invasive species including halogeton (*Halogeton glomeratus*), Russian thistle (*Salsola tragus*), and tansy mustard (*Descurania* spp.) are common elements along disturbed roadsides and heavily grazed areas.

Great Basin Desert Scrub

Great Basin Desert Scrub evolved from both cold-temperate and warm-temperate vegetation and is characterized by communities dominated by sagebrush (*Artemisia* spp.), shadescale (*A. confertifolia*), or winterfat (*Krascheninnikovia lanata*) (Brown, 1994). Blackbrush (*Coleogyne ramosissima*), greasewood (*Sarcobatus vermiculatus*), and rabbitbrush (*Chrysothamnus* spp.) are also common and are often co-dominant or present in many Great Basin plant communities. These plant communities are composed of small, dense, aromatic shrubs and occur to some extent at several locations in the proposed ADA activity area. In this region winter temperatures are too low to support plants typical of the warmer deserts of the Southwest, such as creosote bush, and few cacti occur (USAF, 2001).

Vegetation located on the lower elevations of the valley and basin floors including the ADA activity area at Dry Lake and Coal Valley, is characterized by monocultures of halophytic (salt-tolerant) shrubs including spiny hopsage (*Grayia spinosa*), four-wing saltbush, and winterfat. Where soils are especially alkaline and clay-rich, as on the margins of dry lake beds (e.g., Coal Valley and Dry Lake Valley), saltbush species including four-wing saltbush, and shadscale dominate the vegetation. Saltbush

communities, especially near playas, may consist exclusively of these species. Other common species observed in this area include rubber rabbitbrush (*C. nauseosus*), sticky rabbitbrush (*C. paniculatus*) or sticky-leaved rabbitbrush (*C. viscidiflorus*), and snakeweed (*Gutierrezia sarothrae*). Because of the timing of the surveys, few herbaceous or graminoid species were observed but included big galletta grass, red three-awn (*Aristada glauca*), Indian rice grass, Utah penstemon (*Penstemon utahensis*), and bristly gilia (*Langloisia setosissima*). Other less common species included scarlet gaura (*Gaura coccinea*), basket bush (*Rhus trilobata*), and black sage (*A. nova*). Spiny chorizanthe (*Chorizanthe rigida*), golden head (*Acamptopappus shockleyi*), and the invasive Russian thistle were also present and in some areas formed dense carpets along the basin floors.

Intermediate elevation slopes located along the periphery of the dry lakes are dominated by Great Basin mixed desert scrub characterized by rabbitbrush, hopsage, winterfat, budsage, and blackbrush. In some areas range ratnay and white bursage co-dominate with four-wing saltbush. Near U.S. Highway 93 at the Pahroc summit pass, Mojave Desert Scrub intergrades with Basin communities and supports small components of Joshua tree, banana yucca (*Y. baccata*), and beavertail cactus. Desert needle grass (*Stipa speciosa*), Indian rice grass, big galletta, and fluff grass occur in open spaces between the shrubs.

Non-woody range weeds like halogeton, Russian thistle, and non-native grasses, including cheatgrass and red brome are locally abundant on disturbed sites and commonly occur in this area (USAF, 2001).

Wilderness Areas and Environmental Areas of Critical Environmental Concern

Several wilderness areas are located in the in the general region of the proposed ADA activity area, and include the Ash Springs Wildlife Area, Desert National Wildlife Range, Key Pittman WMA, Pahranagat National Wildlife Refuge, and Humboldt-Toiyabe National Forest. However, no ADA activities would occur in any designated wilderness area. Similarly, the proposed ADA activities would be limited to rangeland and other disturbed sites and would not occur in any area designated as an area of critical environmental concern.

Vegetation at ADA Sites

To verify existing conditions at each of the proposed ADA sites, the USACE contractor conducted biological surveys between 15-17 October 2004 and 21-22 December 2004. Biological resources on each site were noted and vegetation maps were completed for each of the proposed sites (Appendix C). Due to the timing of the surveys (October and December 2004) short lived annual species dependent on summer rainfall could not be fully detected. Dominant plant communities and cover types associated with Great Basin and Mojave Desert Scrub biomes that occur at the proposed ADA sites include:

- Blackbrush
- Saltbush
- Mojave mixed scrub
- Playa
- Rabbitbrush
- Salt desert scrub
- Urban
- Disturbed grassland
- Basin big sagebrush

The proposed ADA activity area also contains sections of rangeland which appear have been subject to grazing by domestic cattle (*Bos taurus*) and wild horses (*Equus caballus*). Similarly, some areas contain

little or no vegetation, have been previously graded, or have been subject to periodic disturbance from off-road vehicles and recreational use. At two locations the proposed sites would be located at existing dirt airfields, and two sites occur in disturbed areas adjacent to feedlot reservoirs. Table 3.2-1 identifies the existing biological conditions that occur on each of the proposed ADA sites. A list of plants identified in the study area is presented in Appendix C.2.

Table 3.2-1: Site Description and Land Cover Characteristics at Proposed ADA Sites.

ADA Site	Location	Land Type	Land Cover Characteristics
LSA	Alamo Airfield ca. 1 mile west of the community of Alamo	Barren, dirt airfield	Site would be located on the improved dirt airfield. Existing runway is approximately 1 mile long and 0.1 mile in width. Surrounding habitat is characterized as Mojave scrub dominated by creosote bush in association with Mormon tea, Joshua tree, snakeweed, and banana yucca.
PAT 1	Delamar Valley near Delamar Lake	Playa	Barren. Vegetation limited to isolated populations of greasewood and hopsage located near the dirt access road. Invasive species such as Russian thistle and halogeton are present on portions of site but occur primarily on disturbed road edges.
PAT 3/CCC	Delamar Valley ca. 1 mile south of Highway 93	Disturbed grassland, dirt airfield	Located on the south end of a dirt airfield. Activities would occur within the fenced section of the site. Adjacent habitat appears to be subject to periodic mowing and grazing. Dominant species include red three-awn, desert needle grass, and rubber rabbitbrush. Indian rice grass, big galletta grass, and Russian thistle common.
PAT 4	Area west of Pahroc Summit Pass	Blackbrush	Scrubland dominated by blackbrush, white bursage, four-wing saltbush and range ratany. No recent evidence of grazing. Joshua tree, creosote bush, and elements of big sage brush also present. Beavertail, silver cholla, and old man cactus present. Small population of basket bush located on southern section.
PAT 101	Delamar Valley ca. 8 miles north of Delamar Lake	Disturbed, barren feed lot area	Area located near feedlot reservoir. Many areas lack vegetation and consist of hard packed soils. Russian thistle dominates vegetative component at the site.
PAT 102	Delamar Valley ca. 3 miles south of Highway 93	Disturbed rabbitbrush and playa	Area located near feedlot reservoir. Many areas lack vegetation. Dominant vegetation includes disturbed rabbitbrush community, budsage, Indian rice grass, and snakeweed. Russian thistle common. Joshua trees and winterfat present to a limited extent.
PAT 103	Dry Lake Valley ca. 9 miles north of Highway 93	Disturbed Salt Desert Scrub	Evidence of historic grazing. Site dominated by Russian thistle, rabbitbrush, and cheat grass. Other species include mallow, Indian rice grass, and big galletta.
PAT 104	Dry Lake Valley ca. 20 miles north of Highway 93	Disturbed grassland	Disturbed grassland with heavy component of Russian thistle. Indian rice grass and big galletta are also present.
PAT 104A	Dry Lake Valley ca. 20 miles north of Highway 93	Disturbed grassland	Grassland dominated by cheatgrass, Indian rice grass, and big galletta. Russian thistle common. Other species includes snakeweed, Mormon tea, and winterfat.

Noxious Weeds

An inventory of noxious weeds has been conducted for sections of the proposed activity area. The BLM identified three locations in the Dry Lake Valley where populations of noxious weeds are present. These areas would be identified and avoided during the proposed ADA activities. However, no plants listed as Noxious by the State of Nevada or BLM were identified at any of the proposed ADA sites. Invasive non-native species such as halogeton, Russian thistle, and brome grasses are common in the region and at some ADA locations.

3.2.3 Wildlife

Few wildlife species were observed during the October and December reconnaissance surveys and with the exception of cattle and wild horses, large mammals were not observed in the ADA activity area. Common mammal species observed during the survey included desert cottontail rabbit (*Sylvilagus audubonii*), antelope squirrels (*Ammospermophilus* sp.), and black-tailed jackrabbits (*Lepus californicus*). Small rodent burrows were common and were present to some degree at most of the proposed ADA sites. Near Dry Lake Valley and Coal Valley several sets of tracks were located in the dry playa and indicate the general area supports populations of mule deer (*Odocoileus hemionus*) and coyote (*Canis latrans*). Other common species expected to occur in the general ADA activity area include badger (*Taxidea taxus*), kangaroo rats (*Dipodmys* ssp.), pronghorn antelope (*Antilocapra americana*), and at higher elevations, Desert bighorn sheep (*Ovis canadensis*). Populations of bighorn sheep are known to occur in the adjacent Pahranagat Range, the Sheep Range, and the Delamar Mountains, but are not expected to occur in or adjacent to the proposed ADA sites (USAF, 2001).

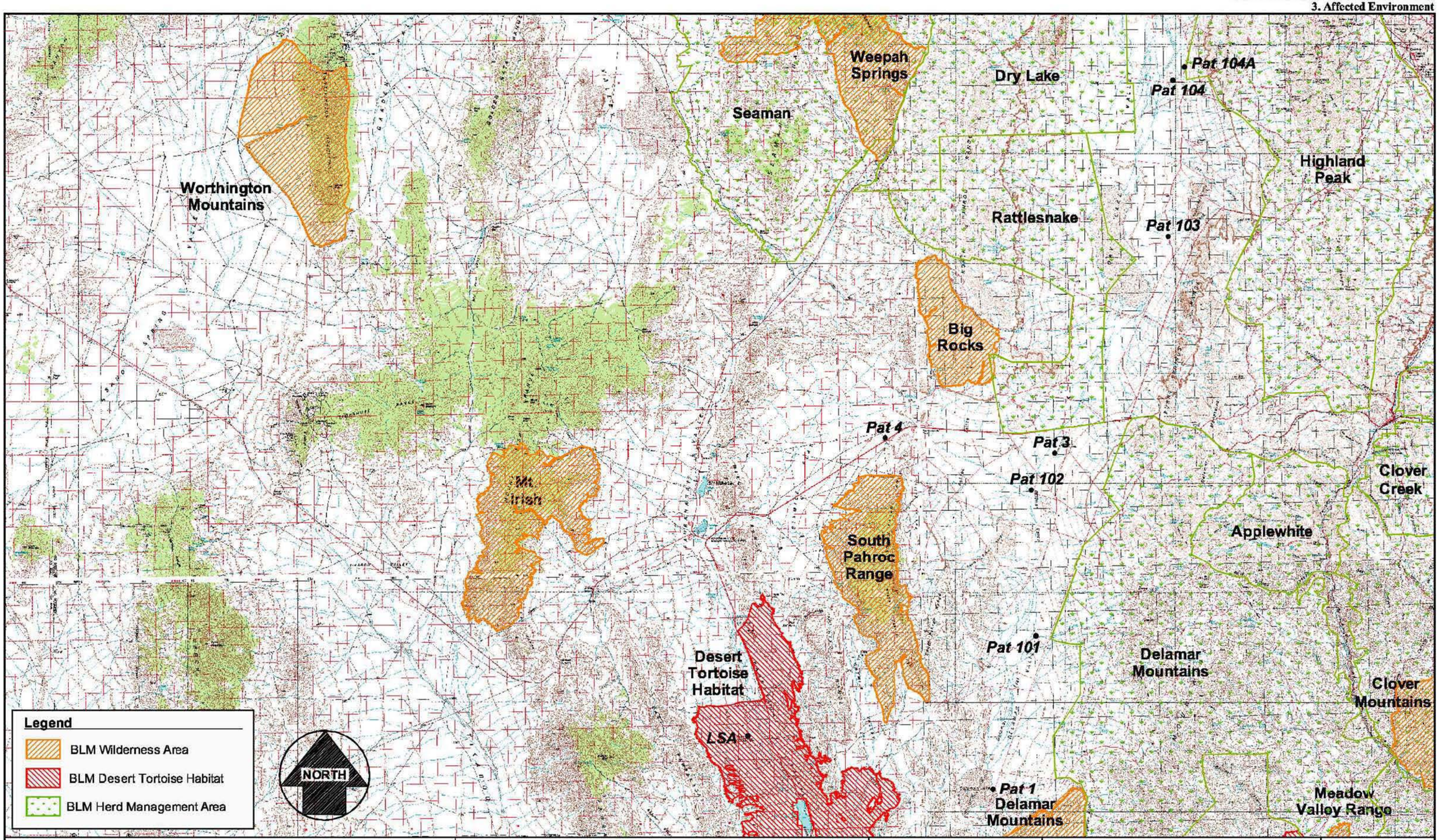
Several common bird species were observed within or adjacent to the proposed ADA activity area including Gambel's quail (*Callipepla gambelii*) observed near an active cattle trough, American crow (*Corvus brachyrhynchos*) identified in agricultural land in the Pahranagat Valley, mourning dove (*Zenaida macroura*), and Horned Lark (*Eremophila alpestris*). Ravens (*C. corax*) and red-tailed hawk (*Buteo jamaicensis*) were observed in the Delamar and Dry Lake Valleys.

Although a number of reptile species may occur within the proposed ADA activity area, only Basin rattlesnake (*Crotalus viridis lutosus*), gopher snake (*Pituophis melanoleucus*), side-blotched lizards (*Uta stansburiana*) and western whiptails (*Cnemidophorus tigris*) were observed during the surveys.

Wild Horses

Wild horses and burros (*E. assinus*) were released by ranchers, miners, and others over the past 100 years, and are now common range land species in the western United States and particularly in Nevada (Slade and Godfrey, 1982). Wild horses and burros are protected under Public Law 92-195, the Wild Free-Roaming Horse and Burro Act of 1971. Under this act, the BLM and United States Forest Service (USFS) are charged with managing and protecting these animals.

Several wild horse Herd Management Areas (HMA) occur in the proposed ADA activity area, as shown on Figure 3.2-1. From north to south, these include the Coal Valley, Dry Lake Valley, Seamans, Rattlesnake, and Delamar Mountains. A small population of wild horses (less than 20 animals) was observed ranging in the northern section of the proposed ADA activity area in the Coal Valley and one wild horse was observed in the Delamar Valley. Wild horses use much of the area on a yearlong basis. Their summer range encompasses the Seaman Range and the Grant Mountains to the west. Seaman wild horses winter in Coal Valley and the White River Valley (BLM, 2005a). Wild horses prefer to graze on grasses and grass-like species found throughout the area and the winterfat flats located in the valley bottoms. They also utilize other shrubs and forbs when necessary (BLM, 2005a). Foals are typically born in the spring and may be present in some areas during the proposed ADA activities.



	Joint Red Flag '05 ADA Activities	Scale: 1" = 5 miles Date: February 15, 2005 File: 9313nellisafbpt3.dwg	Location of ADA Sites and Sensitive Resources	Figure 3.2-1

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No Patriot ADA sites are located within any of the identified HMA (Figure 3.2-1). In addition, most of the proposed ADA activities would occur outside of HMA. Mobile Avenger and Sentinel units (less than 12 vehicles) could enter the Rattlesnake, Seamans, Delamar Mountains, and possibly the Coal Valley HMA.

Migratory Birds

The Pahranagat Valley and associated upland areas provide important habitat for a variety of migratory birds utilizing the western flyway. Riparian and scrub communities provide shade, resting areas, protection from predators, and foraging, nesting and breeding habitat. With the exception of a few non-native species, all migratory birds are protected under the Migratory Bird Act. In addition, several federally protected migrants have been documented in the general region including the southwestern willow flycatcher (*Empidonax traillii extimus*). Other migrant species forage and rest in large numbers in the valley's riparian vegetation, including Say's phoebe (*Sayornis saya*), cactus wren (*Campylorhynchus brunneicapillus*), and horned lark (*Eremophila alpestris*). The BLM (IM NV-040-2001-02) provides direction regarding activities that may affect migratory birds and has identified a "no-activity" period between 1 May to 15 July each year. No ADA activities are proposed to occur during the identified "no-activity" period.

3.2.4 Sensitive Species

Special status species include those listed as threatened or endangered under the Federal Endangered Species Act (ESA), species proposed for listing, species of special concern, and other species identified either by the USFWS, BLM, or Nevada Department of Wildlife as unique or rare, and which have the potential to occur in the ADA activity area. Nevada BLM Sensitive Species are species designated by the State Director, in cooperation with the Nevada Department of Conservation and Natural Resources, that are not already Federally listed, proposed, or candidate species, or state listed because of potential endangerment. BLM's policy is to "ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as threatened or endangered."

The USFWS identified eight federally endangered, threatened, or proposed species that may occur in the proposed ADA activity area. These species, including their status, habitat requirements, and potential to occur within the study area are presented in Table 3.2-2 (Vegetation) and Table 3.2-3 (Wildlife). This information is consistent with the sensitive species list developed for the Nellis Air Force Land Acquisition Environmental Impact Statement (EIS) (USAF, 1999a) and Nellis Air Force Base Natural Resources Integrated Management Plan (USAF, 2001). The following sections summarize species that have been observed or are expected to occur in areas affected by the proposed ADA activities.

3.2.4.1 Vegetation

A large number of special status plants have the potential to occur region wide; however, only nine sensitive plant species have been identified as occurring in this section of the MOA and with the potential to occur at any of the proposed ADA sites (USAF, 1999a). These are listed in Table 3.2-2 and

include: Eastwood milkweed (*Asclepias eastwoodiana*), rock purpusia (*Ivesia arizonica* var. *saxosa*), Merriam's bearpoppy (*Arctomecon merriami*), Ackerman milkvetch (*Astragalus ackermanii*), Peck Station milkvetch (*Astragalus eurylobus*), Beatley's phacelia (*Phacelia beatleyae*), wax flower (*Jamesia tetrapetala*), Parish's phacelia (*Phacelia parishii*), and pygmy pore leaf (*Porophyllum pygmaeum*). Although some ADA sites could support populations of rare plants under ideal conditions, most of the sites are located in areas subject to grazing or in areas that support sparse or invasive vegetation. No threatened or endangered plant species were observed or identified at any of the proposed ADA sites.

Table 3.2-2: Special Status Plants with the Potential to Occur in the Proposed ADA Activity Area

Common Name *Scientific Name*	Status Federal/ State	Associated Habitats	Potential for Occurrence
Eastwood milkweed *Asclepia eastwoodiana*	SOC, BLM	Alkaline clay hills, gravelly drainages, and shadescale scrub (5,300-6,900)	Could occur in adjacent habitat, suitable habitat present, not observed during surveys.
Rock purpusia *Ivesia arizonica* var. *saxosa*	BLM	Crevices of cliffs and, upper mixed-shrub, sagebrush, and pinyon-juniper zones.	Low, suitable habitat present in areas subject to disturbance, not observed during surveys.
Merriam's bearpoppy Arctomecon merriami	SOC, BLM	Gravelly soils, limestone outcrops, playas, and Mojave scrub communities	Low, not observed during surveys
Ackerman milkvetch *Astragalus ackermanii*	SOC	Ledges and crevices of limestone cliffs	Low, habitat not present, not observed during surveys
Peck Station milkvetch *Astragalus eurylobus*	SOC, BLM	Generally deep, barren, sandy, gravelly, or clay soils derived from sandstone or siliceous volcanic material, frequently in or along drainages.	Low, not observed during surveys
Beatley's phacelia *Phacelia beatleyae*	SOC, BLM	Washes, canyons, and slopes of creosote and shadescale scrub.	Could occur, not observed during surveys
Wax flower *Jamesia tetrapetala*	SOC, BLM	Pinyon-juniper forests.	Low, habitat not present on site, not observed during surveys
Parish's phacelia *Phacelia parishii*	SOC, BLM	Playa's shadescale scrub	Could occur, not observed during surveys
Pygmy pore leaf *Porophyllum pygmaeum*	SOC, BLM	Dry, open, rocky carbonate soils of alluvial fans and hillsides, often in slight depressions, low benches adjacent to minor drainages, or other moisture-enhanced microsites, in blackbrush, mixed-shrub, and lower pinyon-juniper zones.	Low, not observed during surveys

Federal Status
FC = Candidate for listing
SOC = Species of special concern
BLM = BLM Sensitive species

State
CE = critically endangered

3.2.4.2 Wildlife

There are currently 28 sensitive species that either occur or have the potential to occur within the proposed ADA activity area. However, many of these species occur in areas that would not be utilized during the proposed ADA activities (riverine, wetland, mountain tops) and therefore are not discussed in detail in this document. Table 3.2-3 describes the occurrence, relative distance, and potential impacts from the proposed ADA activities for these species. Only six species have the potential to be either closely associated with the proposed ADA sites or could be potentially affected by implementation of the proposed ADA activities and, therefore, warrant further discussion. These species include:

- Desert tortoise (*Gopherus agassizii*): federal and state threatened;

- Chuckwalla (*Sauromalus obesus*): federal species of special concern;
- Banded Gila monster (*Heloderma suspectum cinctum*): federal species of special concern;
- Burrowing owl (*Athene cucicularia hypugaea*): federal species of special concern;
- Ferruginous hawk (*Buteo regalis*): federal and state species of special concern; and
- Pygmy rabbit (*Brachylagus idahoensis*): federal species of special concern.

Table 3.2-3 Special Status Wildlife Species with the Potential to Occur in the Proposed ADA Activity Area

Common Name Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Proposed ADA Activity Area
Fish			
White River spring fish *Crenichthys baileyi baileyi*	FE	Desert springs	Known to occur in the Pahranagat Valley. No habitat occurs near any ADA site.
Hiko White River Springfish *Crenichthys baileyi grandis*	FE	Desert springs and drainages.	Known to occur in the Pahranagat Valley. No habitat occurs near any ADA site.
Pahranagat Roundtail Chub *Gila robusta jordani*	FE, SE	Desert springs and drainages.	Under MOA airspace, in Ash Spring outflow in Pahranagat Valley, Lincoln Co. No habitat occurs near any ADA site.
Big Spring Spinedace *Lepidoma mollispinis pratensis*	FT, SP	Desert springs and drainages.	Under MOA airspace, near Panaca in Coyote Canyon, Meadow Valley Wash drainage, in Pahranagat Valley, Lincoln Co. No habitat occurs near any ADA site.
Mormon White River Springfish Crenichthys baileyi thermophilus	FSC, BLM	Desert springs and drainages.	Under MOA airspace, in White River-Pahranagat Valley, Lincoln Co. No habitat occurs near any ADA site.
Reptiles			
Desert tortoise *Gopherus agassizii*	FT, ST	Desert Scrub Communities	Potential to occur in southern section of ADA activity area, known to occur between Alamo and Ash Springs. Protocol surveys conducted at the LSA did not detect the presence of this species. Reconnaissance surveys completed at each of the ADA sites did not detect the presence or sign of this species. Tortoise sign identified adjacent to the Alamo Canyon access road.
Chuckwalla *Sauromalus obesus*	SOC, BLM	Rocky hillsides, boulders in Mojave scrub communities	Potential to occur in southern area, known to occur in rocky areas associated with many of the proposed ADA sites, not observed during October surveys.
Banded Gila monster *Heloderma suspectum cinctum*	SOC, ST	Mojave desert scrub communities, rocky hills and washes	Limited potential to occur at southern sites. Extreme northern range of this species. Few recorded sightings of this species.
Birds			
Bald eagle *Haliaeetus leucocephalus*	FT, SE, BLM	Winters at lakes, reservoirs, river systems, and some rangelands. Breeding habitats include mountainous regions near reservoirs, lakes and rivers.	Potential habitat for this species occurs in the Pahranagat Valley and the Pahranagat National Wildlife refuge. No habitat occurs within 2 miles of any ADA site.
Southwestern willow flycatcher *Empidonax traillii extimus*	FE, SP, BLM	Obligate riparian species that breeds along rivers, streams, wetlands, and other aquatic-associated habitats.	Potential habitat for this species occurs in the Pahranagat Valley and the Pahranagat National Wildlife refuge. No habitat occurs within 2 miles of any ADA site.

Common Name Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Proposed ADA Activity Area
Least bittern Ixobrychus exilis hesperis	FSC	Marshes, seeps, riparian communities., and salt marsh	Observed in wetlands of Pahranagat Valley. Not expected to occur near any ADA site.
White-faced ibis Plegadis chihi	FSC	Marshes, seeps, riparian communities and salt marsh. Nests on floating reeds.	Observed in wetlands of Pahranagat Valley. Not expected to occur near any ADA site.
Northern goshawk Accipiter gentilis	FSC	Alpine forests of old growth trees.	Spring and fall migrant in low numbers. Not expected to occur near any ADA site.
Phainopepla *Phainopepla nitens*	BLM, SP	Scrub communities close to permanent water.	A permanent resident of Mojave Desert scrub and desert spring habitats. Observed on NTTR. Not expected to occur near any ADA sites. Suitable habitat not present.
Ferruginous hawk *Buteo regalis*	SOC	Scrub habitats, sagebrush and open grasslands. Nests on rock pillars or ground.	This species is known to occur in the Coal Valley. Not observed during biological surveys.
Burrowing owl *Athene cunicularia*	SOC, SP	Disturbed habitats, sage steppes, shrub land and grassland.	Potential to occur in the ADA activity area. Not observed during surveys.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	SP	Floodplain riparian forests. Prefers nesting habitat consisting of cottonwood willow riparian forest.	Potential habitat for this species occurs in the Pahranagat Valley and the Pahranagat National Wildlife refuge. No habitat occurs within 2 miles of the ADA activity area.
Black tern Chlidonias niger	FSC, BLM	Wetlands, marshes and riparian communities.	Observed at wetlands in Pahranagat Valley. Suitable habitat dose not occur at any of the proposed ADA sites.
Mammals			
Townsend's big-eared bat *Corynorhinus townsendii*	FSC, BLM	Desert shrub to deciduous and coniferous forests at a wide range of elevations. Will use caves, mines, tree and rock cavities for roosting	The proposed ADA activity area has foraging habitat, and adjacent hillsides provide potentially suitable breeding and roosting habitat for this species. Not expected occur on ADA sites.
Pygmy rabbit *Brachylagus idahoensis*	FSC	Sagebrush and rabbitbrush communities	May occur in northern limit of ADA activity area. No burrows observed at any ADA site. Not expected to be impacted by proposed ADA activities.
Pahranagat Valley montane vole *Microtus montanus fucosus*	BLM	Found in grassy areas near springs	Known to occur in the Pahranagat Valley. Suitable habitat near ADA sites absent.
Spotted bat *Euderma maculatum*	FSC, ST	Roosts in crevices in cliff faces, bridges, and mines	Could occur in ADA activity area but not likely to occur near proposed ADA sites.
Allen's big-eared bat *Idionycteris phyllotis*	FSC, BLM	Pine and oak forests. Roosts in caves and mines.	Outside suitable range of this species. Not likely to occur near any ADA site.
California leaf-nosed bat *Macrotus californicus*	FSC, BLM	Desert scrub. Roosts in caves and abandoned buildings	Could occur in ADA activity area but not likely to occur near proposed ADA sites.
Western small-footed myotis *Myotis ciliolabrum*	FSC, BLM	Desert scrub, chaparral and rangeland. Roosts in mines and caves.	Known to occur in general region. Not likely to be effected by ADA sites.
Long-eared myotis Myotis evotis	FSC, BLM	Desert scrub, forest, and chaparral. Roosts in cliff faces, caves, mines and abandoned buildings	Could occur in region. Prefers forest communities. Not expected to occur at any ADA sites.

Common Name Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Proposed ADA Activity Area
Fringed myotis Myotis thysanodes	FSC, BLM	Desert scrub, shrub-steppe, oak- pinyon and coniferous forest habitats. Roosts in caves, rock crevices and buildings.	Known to occur in general region. Not likely to be effected by ADA sites.
Long-legged myotis Myotis volans	FSC, BLM	Typically associated with montane forests, riparian and desert habitats. Roosts in rock crevices in cliffs, cracks in ground, behind loose bark on trees and in buildings.	Known to occur in general region. Not likely to be effected by ADA sites.

FT = Federally Threatened Species
FE = Federally Endangered Species
FSC = Federal Species of Special Concern
FWSMC = USFWS-protected migratory species
BLM = BLM Sensitive Species
SE = State Endangered Species
ST = State Threatened species

Sources: USAF, 1999a, 2001; Nevada Natural Heritage Division, 2004; NDOW, 2004a, 2004b, 2004c; USFWS 2005.

Desert Tortoise

The Mojave Desert population of the desert tortoise was listed as threatened by the USFWS on April 2, 1990. The decline of this species has been attributed to disease, predation from increased raven populations, collecting, vehicle mortalities, and habitat degradation, destruction, and fragmentation. The desert tortoise is the only Federally listed wildlife species that has the potential to occur in the proposed ADA activity area. Specifically, this species has the potential to occur at lower elevations east of Alamo near the Hiko Range. This area supports Mojave Desert scrub habitat at elevations generally below 4,000 feet and several sightings of this species have been recorded in the general area in 2003 (NDOW, 2004a). Desert tortoises occur in flat areas, washes, bajadas and valleys and are found in a variety of plant communities including Joshua tree, Mojave yucca, creosote bush, and salt bush scrub, on a variety of soil types.

This species is active primarily in spring (early March through May) and in fall, and remains underground in burrows during extremely hot (June through early September) or cold temperatures (October through late February). Tortoises may emerge from their burrows on warm winter days or during the cooler parts of the day during the summer. Tortoise diet includes herbaceous perennial and annual forbs, grasses, and fresh pads and buds of some species of cacti. Females lay one clutch of eggs between April and July and most young hatch in fall, although some clutches may overwinter and hatch in the spring.

Predators on adult desert tortoises include kit fox, badger, coyote, bobcat, and golden eagle. Juvenile tortoises are more likely than adults to be preyed upon by these same predators and also by ravens, skunks, and some species of snakes. Tortoises are preyed upon primarily during times when other food items are scarce. Because of their low density, tortoises are not a primary food source for these predators, but are taken opportunistically. Desert tortoises may have limited potential to occur at several locations in the proposed ADA activity area. Reconnaissance surveys did not detect the presence or sign of this species at any of the proposed ADA sites. However, several sightings of desert

tortoise have been recorded in the United States Geological Survey (USGS) quads Alamo SE and Alamo (NDOW, 2004a). In addition, BLM has identified tortoise habitat in the area of the proposed LSA site. See Figure 3.2-1 for a map of known desert tortoise habitat. In addition a single, possible desert tortoise burrow was noted in a drainage bank near the Richardville Cemetery, just north of Alamo and four well-bleached fragments of an old tortoise carcass were found adjacent to U.S. Highway 93 approximately three miles north of the community of Alamo (LCTS, 2004). In the same general vicinity, a single fragment of a more recent tortoise carcass (partial scute still adhering) was noted in the ditch alongside U.S. Highway 93 (LCTS, 2004). Based on the existing information and coordination with the USFWS, protocol level tortoise surveys were conducted in February 2005 in and adjacent to the proposed LSA site, the LSA access road, and the access road into the Delamar Valley (Alamo Canyon Road). The USACE also completed a Biological Assessment (BA) to evaluate potential impacts to this species (Appendix D). No sign of desert tortoise was identified at the proposed LSA site or the LSA access road. However, tortoise sign was identified along the Alamo Canyon access road leading from U.S. Highway 93 to the Delamar Valley area.

Chuckwalla

The chuckwalla is a large, uncommon lizard known to the Mojave and Sonoran deserts of southeastern California, southern Nevada, and Utah. This species is typically associated with rocky hillsides, lava flows, and rock outcroppings. Strictly herbivorous, this species feeds on flowers, leaves, buds, cactus fruit, and other low growing desert plants. Males establish territory prior to the breeding season and will defend the area from other males. Reproduction occurs between June and August. This species was not observed during the October or December biological surveys, but could occur in limited sections of the proposed ADA activity area.

Banded Gila Monster

The Banded Gila monster is a member of the only family of venomous lizards in the world. It is a large, heavy-bodied lizard with a massive head, a short, swollen sausage-shaped tail and a mottled pattern of black and pink, orange, or yellow beadlike scales. Its dark forked tongue flicks out in snake-like fashion. The legs are short and appear set too far apart to support the lengthy body. The feet have strong curved claws used for digging. Although venomous, these lizards are not dangerous unless molested or handled. Primarily nocturnal, these animals are active at dusk and at night during the summer. During the day they seek shelter in burrows or under rocks. In the spring and occasionally winter, they are active during the day. This species feeds on small rodents, other reptiles, bird eggs, and insects. Gila monsters breed during summer months and place eggs in sandy nests during the fall and winter. This species is rarely seen and was not observed during the October or December biological surveys. If present in the proposed ADA activity area, this species would be limited to the southern extreme of the ADA activity area.

Burrowing Owl

This species are year long residents of open, dry habitats, including open shrub stages and juniper habitat. Burrowing owls typically utilize abandoned rodent burrows for nesting cover, but will occupy

pipes, crevices, and small openings in rock faces. Adult's perch near the nest burrow during the morning and evening hours and take cover in the nest during the hottest part of the day. Burrowing owls prey on insects, small mammals, reptiles, and carrion. Burrowing owls are known to successfully nest in and adjacent to developed areas including college campuses, highways, rail lines, and airports. However, burrowing owls rely upon rodent burrows and suitable foraging habitat to survive and many human activities including poisoning and trapping rodents, discing, and paving land have reduced habitat for this species and contributed to its population decline. This species is known to occur in the ADA activity area, however, it was not observed during the October or December biological surveys or at any of the proposed ADA sites. In addition, no suitable burrows were identified in or adjacent to the proposed ADA sites.

Ferruginous Hawk

This species is a resident and winter migrant at lower elevations in the Great Basin. Ferruginous hawks frequent open grasslands, sagebrush, and fringes of juniper habitats where small mammals are present. Ferruginous hawks on rare occasions nest in the vicinity of the northern portion of the proposed ADA activity area. This species is known to occur in the Coal Valley, although this species was not observed during the October or December surveys.

Pygmy Rabbit

The pygmy rabbit is the smallest rabbit species in North America and is found only in the sagebrush and pinyon juniper habitat in the Basin and Modoc Plateau Regions in California, Oregon, Nevada, Idaho, Washington, and Utah (Orr, 1940; Janson, 1946; Wilde, 1978). The pygmy rabbit is dependent upon sagebrush, primarily big sagebrush, and is usually found in areas where big sagebrush grows in very dense stands. Tall, dense sagebrush clumps are essential for this species (Orr, 1940). This species is believed to avoid heavily grazed areas and populations are thought to be randomly distributed (CDFG, 1990). Reproduction typically begins in January, peaks in March, and declines in June (Janson, 1946; Wilde, 1978). Bradfield (1974), reports that the young are born in the burrows; however, nests are unknown. It is believed that juvenile pygmy rabbits are individually hidden by adults at the bases of small shrubs (Wilde, 1978). Potential pygmy rabbit habitat occurs in the extreme northern section of the ADA activity area in the Coal and Garden Valleys.

3.3 WATER RESOURCES AND HYDROLOGY

3.3.1 Existing Conditions

The proposed ADA activities are located within the Great Basin Region of the Basin and Range Physiographic Province of the United States. This province is characterized by north/south trending mountain ranges that are separated by alluvial basins and valleys. Topographic features that characterize the valley area include steep mountain slopes, alluvial fans and terraces, and floodplains. Drainage channels dissect the major alluvial fans and terraces throughout the area. The White River is the main river that intersects the proposed ADA activity area.

The Great Basin subprovince is characterized by low rain fall, ephemeral streams, internal surface drainages, and large, sparsely distributed springs. Because the area drains internally, no streams that rise within the Basin and Range Province carry water to the oceans. Practically all the precipitation that falls in the area is returned to the atmosphere by evaporation, either directly from the soil or from the lakes and playas that occupy the lowest points within the basins which act as discharge areas for the alluvial aquifers. Within the Basin and Range Physiographic province, and thus the area of the proposed ADA activities, groundwater moves under the influence of hydraulic gradients along convoluted pathways (characterized as areas of higher precipitation) and areas of surface discharge (characterized by springs and playas). Aquifers in the regions are primarily composed of carbonate-rock and basin-fill material (USGS, 1995).

The proposed ADA activities would occur on BLM land in Lincoln County. However, a small component (access along Interstate 5 and U.S. Highway 93) would occur in Clark County. Of the nine proposed ADA sites, four would be located in Delamar Valley, three would be located in Dry Lake Valley, and one would be located in the Six Mile Flat area. The LSA site would be located at the Alamo airfield in the Pahranagat Valley.

3.3.2 Surface Water

Hydrology

The scarcity of surface water resources in the area of the proposed ADA activities is attributed to the dry, regional climate characterized by low precipitation, high evaporation, low humidity, and wide extremes in daily temperatures. Dry desert valleys give way to wetter mountain ranges across the entire region. Temperatures range from below freezing in the winter to over 100°F in the summer months. Typically, the southern deserts of the region experience much warmer temperatures than in the northern region. In 2000, the average temperature ranged from 14.6°F in January to 100.3°F in July (Lincoln County, 2001). Table 3.3-1 summarizes average temperature and precipitation for the area of the proposed ADA activities.

Table 3.3-1: Annual Average Precipitation, Temperature and Snowfall Data

Location	Average Temperature (°F/°C)				Precipitation (inc./cm)		
	January		July		Wettest Month	Driest Month	Total Annual Average
	(min)	(max)	(min)	(max)			
Alamo	20.1/ -6.6	51.0/ 10.5	55.0/ 12.7	100.3/ 37.8	(Jan) 0.65/ 0.18	(June) 0.07/ 0.18	4.88/ 12.4
Caliente	17.4/ -8.1	46.2/ 7.8	56.5/ 13.6	95.4/ 35.2	(March)1.05/ 0.89	(June) 0.35/ 0.89	9.04/ 23.0
Elgin	28.2/ -2.1	53.0/ 11.6	60.1/ 15.6	98.0/ 36.6	(Feb) 2.02/ 1.04	(June) 0.41/ 1.04	12.30/ 31.2
Hiko	23.9/ -4.5	50.4/ 12.2	59.4/ 15.2	96.0/ 35.5	(March) 0.86/ 0.74	(June) 0.29/ 0.74	7.94/ 20.2
Pioche	21.2/ -6.0	41.5/ 5.3	58.3/ 14.6	87.7/ 31.0	(Jan) 1.57/ 1.23	(June) 0.48/ 1.23	13.37/ 34.0
Rachel	14.6/ -9.6	45.0/ 7.2	53.8/ 12.1	94.0/ 34.4	(March) 1.07/ 0.66	(June) 0.26/ 0.66	7.87/ 20.0

Source: Lincoln County, 2001.

Winter precipitation often falls as snow at higher elevations, which is more important with respect to runoff and groundwater recharge. Winter storms in the area are regional in nature. Snow packs in the high mountains store enough moisture to permit runoff to overcome high evaporation and transpiration rates in the warmer summer months. Although days of measurable snowfall are very few in the lower

elevations, snow may remain in the mountains during winter and early spring at elevations as low as 8,500 feet.

The area of the proposed ADA activities falls within the eastern portion of the Central Hydrographic basin, and the central portion of the Colorado Hydrographic basin region. The Central Hydrographic region is the largest hydrographic region in Nevada covering approximately 121,167 km^2 (46,783 square miles), and includes Nye, Lincoln and Clark Counties. The Colorado Hydrographic region covers approximately 32,054 km^2 (12,376 square miles) and also includes portions of Clark, Lincoln and Nye Counties, among other counties.

Ephemeral Streams

Due to the arid conditions of the desert, most of the surface waters that exist in the area of the proposed ADA activities are ephemeral streams. An ephemeral stream is a stream or reach of a channel that flows only in direct response to precipitation in the immediate locality, and whose channel is at all times above the saturation zone. This means that an ephemeral stream will lose water to the streambed, ensuring a decrease in flood discharge downstream in the absence of significant tributary flows (Briggs, 1996). The ephemeral streams in the area of the proposed ADA activities exist in normally dry washes and playa surfaces (dry lake beds), and only occur immediately following rainstorms. The proposed ADA activities would cross several dry streams, washes and playas but would not occur in ponded or flowing water (SOP).

Surface water runoff in this region typically collects in the many playas found throughout the area. Surface water runoff flowing eastward from the Seamen, Mount Irish and Pahranagat Mountain Ranges collects into the Pahranagat Valley, feeding into the White River. Surface water runoff flowing westward from the North and South Pahroc Ranges also drains into the Pahranagat Valley, while the runoff flowing east collects into the Dry Lake and Delamar Valleys. Surface runoff from the Golden Gate Range accumulates in the Coal Valley. Although a number of creeks and ephemeral drainages cross the region, no ADA activities would occur in ponded or flowing water (SOP).

Perennial Surface Water

The only perennial surface water stream in the area of the proposed ADA activities is the White River. The White River watershed is the main watershed in the area of the proposed ADA activities; however, no activities would occur in or adjacent to this resource. This ancient perennial river is a tributary of the Colorado River and has cut canyons through the bedrock, displacing large quantities of unconsolidated sediments. The White River has established a well defined but narrow flood plain, one-quarter to one-half mile in width through the Pahranagat Valley. Today, the riverbed is dry both above and below the valley, but there is water in the valley that comes from large thermal springs along the flood plain, primarily Ash Springs and Crystal Springs. Between 1990 and 2003, the monthly mean stream flow for White River ranged between 0 cubic feet per second (ft^3/s) and 2.25 ft^3/s (USGS, 2004). In addition to the White River watershed, there are two major watersheds that partially fall within the area of the proposed ADA activities: Sand Spring – Tikaboo Valley Watershed and the Dry lake Valley Watershed.

Perennial surface waters located in the region include several lakes and springs. There are five major lakes in the area of the proposed ADA activities, all of which are located in the Pahranagat Valley. The list below summarizes these hydrologic features.

- Nesbitt Lake - located approximately 2.8 miles north of Crystal Springs;
- Frenchy Lake - located immediately north of Crystal Springs and the Key Pittman Wildlife Management Area;
- Upper Pahranagat Lake - located within the Pahranagat National Wildlife Refuge, approximately 3.8 miles southeast of the City of Alamo;
- Lower Pahranagat Lake - located within the Pahranagat National Wildlife Refuge, approximately 4.7 miles southeast of Upper Pahranagat Lake; and
- Maynard Lake - located within the Pahranagat National Wildlife Refuge, approximately 2.8 miles southeast of Upper Pahranagat Lake. Water rarely flows below Maynard Lake.

Other perennial surface water originates from springs where the ground water table intersects the surface and remains as (a) a flow for a short reach (which is underlain by bedrock), (b) pools at some large springs, or (c) poorly drained areas around the valley edges. Springs in the mountain areas discharge from perched water zones or emerge in areas where groundwater has migrated along fractures in the rocks and flows to the surface because of changes in geologic structure or material. Discharge from these springs flow along the surface for relatively short distance before infiltrating into the soil. There are large, sparsely distributed springs within the area of the proposed ADA activities. Some of the main springs include Crystals Springs, Ash Springs, and Lone Tree Springs. Monthly mean stream flow for Ash Spring and Crystal Spring in 2002 ranged from 12.4 to15.0 ft^3/s and from 9.5 to 13.2 ft^3/s, respectively (UGSG, 2004).

Floodplains

As described above, much of the warm weather precipitation is lost to the atmosphere through evaporation and transpiration within a short period. Regional storms, which generally occur in the winter months, are typically of low intensity, but can create short-lived ephemeral streams and cause significant flooding on the playa lake beds. Alternatively, locally intense summer thunderstorm within the mountainous portions of the area can produce flooding in the low-lying valleys. Localize thunderstorms produce high-intensity, short duration rainfall events that can result in flash flooding. When a major storm moves into the area, water collects as surface runoff in a short period of time. Consequently, the resultants floods are flash floods which have sharp peaks and short durations. The flash floods contribute to temporary ponding (in dry lake beds) and create ephemeral streams. During summer months, ephemeral streams may only last for a couple of hours, while during the winter months, they have the potential to last for up to a couple of weeks.

Three major dry lake beds occur in the proposed ADA activity area. These are the Delamar Dry Lake, the Dry Lake Valley Lake and the Coal Valley Dry Lake. The Delamar Dry Lake is located in Delamar Valley, between the South Pahroc Range and the Delamar Mountains. The Dry Lake Valley Lake is located in Dry Lake Valley, while the Coal Valley Dry Lake is located in Coal Valley.

Water Quality

The quality of surface water in southern Nevada varies greatly. Surface water quality, especially as it pertains to springs and seeps in the area of the proposed ADA activities, is primarily controlled by the physical and chemical characteristics of the rocks through which the groundwater flows prior to discharge to the surface. Once the water reaches the surface, its quality is affected by other environmental factors such as precipitation, evapotranspiration, erosion, and the chemical characteristics of the rock and soil. Due to the dilution cause by precipitation, concentrations of dissolved solids are usually greatest during periods of low surface flow and lowest during periods of high surface flow (USAF, 1999a).

3.3.3 Groundwater

Hydrogeology

The proposed ADA activities would be located in the Basin and Range Physiographic Province, which contain three main principal aquifer types collectively referred to as the "Basin and Range" aquifers. These are the basin-fill aquifers, the carbonate-rock aquifers, and the volcanic-rock aquifers. These aquifers underlie most of Nevada and parts of southern California, western Utah, southern Arizona, southwestern New Mexico, and southwestern Oregon and Idaho. The region is mainly underlain by basin-fill and carbonate-rock aquifers. These aquifers are formed of unconsolidated to consolidated basin-fill deposits and volcanic and carbonate rocks. In this region of the Basin and Range Physiographic Province, aquifers are not continuous or regional because of the complex faulting in the region (USGS, 1995).

Basin-fill aquifers are the most productive water producing aquifers, and generally occur in alluvial basins separated by low mountains. The water-yielding materials consist primarily of unconsolidated alluvial fan deposits which are the most important hydrologic features of the basins. Basins receive the majority of water recharge through the coarse sediment deposited in the fans. These highly permeable soils allow rapid infiltration of water as streams exit the valleys from the almost impermeable rock of the surrounding mountains and flow out onto the surface of the fans. Many of these valleys and basins are internally drained; that is, water from precipitation that falls within the basin recharges the aquifer and ultimately discharges to the land surface and evaporates in the basin. The greatest opportunity for groundwater recharge is in areas of permeable surface materials, such as alluvial fan deposits, during periods when precipitation is in excess of evapotranspiration. However, because evaporation usually exceeds precipitation rates, the amount of groundwater recharge that occurs on valley floors is generally limited (USAF, 1999a).

The carbonate-rock aquifers that underlie the region can be divided into two parts: an upper sequence of Late Triassic to Early Mississippian age that consist primarily of limestone with minor amounts of dolomite, interbedded with shale and sandstone; and a lower sequence of limestone and dolomite of Middle Devonian to Middle Cambrian age that contains little clastic material. Where the lower carbonate rocks are present, deep drilling data indicated that intervals of these rocks might locally

extend as deep as 15,000 feet. However, this is rare at any given location due to a combination of deep erosion and structural deformation of the carbonate strata (USGS, 1995).

Depth to ground water in the area of and immediately adjacent to the proposed ADA activity area varies through out the region. According to the USGS Real Time Groundwater data recorded during December 2002, the depth to ground water in Lincoln County ranged between 393 to 863 feet below land surface datum (lsd) (USGS, 2004). Groundwater flow beneath the area of the proposed ADA activities is towards the south-southwest. Flow in the local aquifer system of individual basins mimics the surface drainage in most cases. Therefore, groundwater flows from the surrounding highlands toward the topographic low point within the basin, similar to flow of surface water after a storm event.

Groundwater Quality

The quality of ground water in the Basin and Range area vary from basin to basin. Dissolved-solids concentrations range from less than 500 milligrams per liter (freshwater) to more than 10,000 milligrams per liter. In the area of the proposed ADA activities, dissolve solid concentrations vary between 500 milligrams per liter to 1,000 milligrams per liter (USGS, 1995). Generally, groundwater located at the basin margins and on the slopes of alluvial fans, is fresh. Whereas groundwater that accumulates beneath playas in small closed valleys may be brackish. However, the total dissolved solids measured at these locations is often less than levels commonly found in water with no outflow to the sea. Although highly mineralized water is common beneath playas, a deeper freshwater flow system can be present in some areas. For example, water from a well in the Coal Valley, near the western portion of the proposed ADA activity area, has a dissolved-solids concentration of approximately 170 milligrams per liter (USGS, 2004). This concentration apparently reflects deep freshwater circulation in the basin-fill aquifer.

3.4 EARTH RESOURCES (GEOLOGY)

3.4.1 Existing Conditions

The proposed ADA activities lie within the Basin and Range Physiographic Province. As described in Section 3.3.1, this section is characterized by north/south trending valleys and basins bordered by correspondingly oriented mountain ranges. This landscape is a result of simultaneous uplifting of mountains and down-dropping of adjacent valleys in response to stress applied to the continental land mass. Subsequent erosion of the mountain ranges has resulted in the deposition of large alluvial fans and playas that extend from the mountain margins to the valley bottom.

The basins between the mountains increase in elevation from south to north such that elevation as well as latitude contributes to the decline in thermal regimes to the north, and the consequent vegetation change along the basins. Elevations vary substantially across the area of the proposed ADA activities. Elevations range from approximately 1,060 meters (3,400 feet) above sea level in Pahranagat Valley to 1,600 meters (5,240 feet) in Garden Valley. Mountain ranges range in elevation from 1,800 meters (6,100 feet) to 2,500 meters (8,200 feet).

3.4.2 Geology

The geology of the area is structurally complex and consists of many types of rocks that have been subjected to a variety of structural disruptions. These rocks from a complex, three dimensional stratigraphic frame work that can be subdivided into aquifers and various confining units (see Section 4.4.3). The principal rock formation underlying the region consists of a thick sequence of Paleozoic carbonate rock that extends throughout the subsurface of much of central and southeastern Nevada, including the areas of the proposed ADA activities. The strata in this region ranges in age from 250 to 650 million years before present (B.P.). Important formations that interact with the regional flow through the underlying Paleozoic carbonate rocks consist of fractured Cenozoic volcanic rocks and permeable Cenozoic basin-fill.

Stratigraphic units that occur in the region are disrupted by large-magnitude offset thrust, strike slip, and normal faults. Combinations of normal, reverse, and strike-slip faulting and folding episodes associated with the movement of the underlying rock formations have resulted in a complex distribution of rocks. Consequently, diverse rock types, ages, and deformational structures are juxtaposed, creating variable and complex subsurface conditions (USGS, 1995).

Volcanism

Several late Cenozoic silicic calderas occur immediately west of the proposed ADA activity area. The area containing these calderas is referred to as the southwestern Nevada volcanic field. The stonewall caldera, located approximately 85 miles northwest of the town of Alamo, is the youngest major silicic center in the area (7.5 million years). Silicic volcanism is characterized by large-volume explosive eruptions. During the past 10 million years, low-volume, mild eruptions of basalt occurred in the region, resulting in basaltic cinder cones and lava flows. The nearest example of quaternary (past 1.6 million years) volcanic cones and lava flows are at Crater Flat, located in southwestern region of NTTR (USAF, 1999a). No ADA-related activities would occur in the southwestern Nevada volcanic field.

3.4.3 Soils

The soils of the Base and Range have not been mapped in detail. Therefore, the following summary is based on observations made during cultural resources survey work as well as on Quaternary geologic studies in adjacent areas. The soils of this area are aridisols developed in carbonate parent material, usually with weak, vesicular A horizons, strong B horizons and, depending on the age of the parent sediment, moderately to very strongly developed C horizons (USAF, 1999a).

Surface soils in the region range from sandy and clayey loams occurring on alluvial fans, to sand, silty sands, and silts located in the various drainages and the numerous, small, basins that occur in the region. Patchy desert pavements of mostly pebbles and small clasts occur irregularly on stable surfaces associated with alluvial fans deposits, particularly in the southern portion of the proposed ADA activity area. Pebbles, cobbles and small boulders, mostly commonly derived from rhyolitic lavas, quartzite and chert erode from the local mountain, are common and are evident in the alluvium fan formations throughout the region.

3.4.4 Minerals

A variety of industrial minerals and precious metals occur throughout Lincoln County. The earliest known mining occurred on Mount Irish near Hiko in 1865 and a five-stamp mill was erected at Hiko Springs to process silver ore. The Pioche District followed in 1869 with its first production of silver, lead, zinc, and manganese. In the last 50 years, little or no mineral exploration or related activity has occurred. However, with Nevada's gold rush and the high mineralization of the mountain ranges surrounding the area of the proposed ADA activities, the potential for new discoveries are much greater. Mineral exploration in Lincoln County remains ongoing (AARI, 1990).

Other industrial minerals known to occur in Lincoln County include: perlite, clay, soils additives, pumice, cinder, diatomite, fluorspar, gypsum, and zeolite. Additionally, sand and gravel are plentiful within the proposed ADA activity area. Fossil fuels have also been located along the over-thrust belt of the Paleozoic carbonate rocks in eastern Nevada. Currently, Railroad Valley, located northwest of the proposed ADA activity area, is one of the largest known domestic oil reserves in the country (AARI, 1999). Although there is the potential for mineral extraction and mining in the region of the proposed ADA activities, the proposed ADA sites would not be located near or immediately adjacent to a mineral resource area.

3.5 LAND USE

Existing Conditions

Located almost entirely on BLM lands, the proposed ADA activities would occur under NAFB designated airspace. This airspace extends over Nevada's three southeastern counties: Lincoln, Nye, and Clark. However, the ground-based portion of the proposed ADA activities would occur primarily on BLM lands within Lincoln County, while the transport of military vehicles would occur in Lincoln and Clark Counties (see Section 3.10, Transportation).

Lincoln County is primarily undeveloped with expansive open space areas consisting of several mountain ranges and dry lake beds. With the exception of the few towns scattered throughout Lincoln County, the county is mostly composed of BLM land. Land ownership within the county includes USFS land that is located in the northwestern region of the county (e.g., Humboldt-Toiyabe National Forest) and lands under the jurisdiction of the Department of Defense (DOD) and the USFWS, located in the southwestern region of the county (e.g., NTTR and the Desert National Wildlife Range, respectively). However, the ADA sites have been located on BLM land that is outside of these other jurisdictions. The LSA is located on private land located at the Alamo dirt airfield west of the community of Alamo.

The BLM land in Lincoln County has been designated for a variety of uses, which includes agricultural, residential, commercial, and recreational activities such as mining, hunting, and camping (USAF, 1999a). See Section 3.8 (Recreation) for a discussion of recreational activities. In the vicinity of NTTR, nearly all BLM land has been authorized for livestock grazing, which is the sole agricultural activity occurring on these lands. The proposed ADA activities would occur over an area of nearly 2.5 million acres of rangeland, of which 500 acres would be occupied by Patriot sites (two sites of 250 acres each).

It should be noted that of the occupied Patriot sites, only a small area (approximately 60 acres each) would be utilized or affected by vehicular traffic. In addition, the proposed Patriot sites would be located in areas of low foraging value, many of which have been previously disturbed (see Section 3.2).

During the two week exercise period, rancher permittees may be actively grazing cattle in the vicinity of the some of the proposed ADA sites. According to the permittee grazing schedules, 208 cattle are permitted to graze near the proposed LSA site, 281 cattle are permitted near Patriot site 101, and 773 cattle are permitted near Patriot sites 3 and 102 (BLM, 2005c). Cattle may also be scheduled to graze near Patriot site 4 during the proposed ADA activities. The potential use of Patriot sites 101 and 102 could temporarily prevent access to the feedlot reservoirs located adjacent to these sites. None of the remaining Patriot sites would preclude cattle access to active water troughs during the two week exercise period.

In addition to rangeland, 14 Wilderness Areas are located within Lincoln County, which were created by Congress in 2004 (Public Law 108-24) (BLM, 2005d). These areas were designated in order to preserve and protect the land in its natural condition, and are known for their historic, scenic, or scientific value. Certain uses are restricted within each Wilderness Area boundary, such as automobiles, off-highway vehicles, motorcycles, and mountain bikes (BLM, 2005d). Figure 3.2-1 shows the location of the proposed LSA and Patriot sites relative to each Wilderness Area. None of the proposed sites would be located in a designated Wilderness Area.

Clark County is located to the south of Lincoln County and east of Nye County, and is the most urbanized of the southeastern counties. Although it is characterized by similar mountain ranges, central Clark County is predominated by the city of Las Vegas, with NAFB located adjacent to and northeast of Las Vegas. Other jurisdictions within the county include the DOD and the USFWS in the northwestern region (e.g., NTTR and Desert National Wildlife Range, respectively), the USFS in the western region (e.g., Humboldt-Toiyabe National Forest), and the U.S. National Park Service (NPS) in the eastern region of the county (e.g., Lake Mead National Recreation Area). The remaining lands within the county are predominately under the jurisdiction of the BLM. The proposed ADA activities within Clark County would be limited to the transport of equipment and personnel from NAFB to the proposed LSA and ADA sites (see Table 3.5-1), which would occur north along Interstate 15 (I-15) to U.S. Highway 93, and then north along U.S. Highway 93 to Lincoln County. No additional ADA activities would occur in Clark County.

Table 3.5-1: Land Use Designations Adjacent to the Proposed ADA Sites.

Adjacent Land Uses	Land Use Types	Distance to Nearest Site
LINCOLN COUNTY		
Alamo*	Residential Commercial Public Facilities	Approximately 1 mile east of LSA
Alamo airfield	Public Facility	Adjacent to LSA
Ash Springs*	Residential Recreational	Approximately 6 miles north of LSA
Caliente[1]	Residential Industrial/Commercial Recreational	Approximately 16 miles southeast of Patriot 103
Caselton*	Residential Recreational	Approximately 13 miles east of Patriot 104A
Crystal Springs*	Residential Recreational	Approximately 12 miles north of LSA
Caliente Flight Strip	Public Facility	Adjacent to Patriot 3
Desert National Wildlife Range	Recreational Conservation	Approximately 11 miles south of LSA
Elgin*	Residential Recreational	Approximately 20 miles southeast of Patriot 101
Hiko*	Residential Industrial/Commercial Recreational	Approximately 11 miles west of Patriot 4
Humboldt-Toiyabe National Forest	Recreational	Approximately 42 miles northwest of Patriot 4
Nellis Air Force Range	Military	Approximately 7 miles southwest of LSA
Panaca*	Residential Industrial/Commercial Recreational	Approximately 18 miles east of Patriot 103
Pioche*	Residential Commercial Recreational	Approximately 14 miles east of Patriot 104A
Rachel*	Residential Recreational	Approximately 40 miles northwest of LSA
Tempiute*	Residential	Approximately 35 miles northwest of LSA
CLARK COUNTY		
Moapa River Indian Reservation	Residential	Approximately 46 miles south of Patriot 1

Note(s):1. Incorporated city. (*) Unincorporated portions of the respective county.

3.6 AESTHETICS

Existing Conditions

The proposed ADA activities would be located in the Great Basin Physiographic Province. The Basin Province consists of rough, rocky mountains formed by northerly trending fault blocks. These ranges are typically separated by arid basins and ranges. Wide valleys are frequently interconnected across low divides.

The regional character of the proposed ADA activity area is rural and undeveloped, with land uses consisting primarily of public range lands, agricultural operations, scattered rural residences, dispersed recreation facilities and areas, and small rural communities generally located along the U.S. Highway 93/ State Route (SR) 318 travel corridor between Pioche and Las Vegas. Several small communities add to the visual character of the proposed ADA activity area including Alamo and Hiko. There are also

a number of linear facilities in the region including an underground fiber optic line and electric transmission and distribution lines, and miscellaneous communication lines (see Section 3.13).

Views in the proposed ADA activities region are frequently expansive, across flat rangelands and basins in the foreground/middleground, to distant mountains, isolated peaks, and plateaus in the background. The typical viewers of the proposed ADA activities would be local residents, recreational visitors, and motorists traveling on U.S. Highway 93, SR-318, SR-375, and other local roads. Military vehicles and equipment traveling to and from the designated ADA sites during the proposed ADA activities, as well as the mobile Avenger and Sentinel units, would be visible to the public for a short period of time while on these roadways. Two ADA sites (Patriot 3 and Patriot 4) are located directly off U.S. Highway 93 and would be visible to traffic utilizing this highway.

Visual Resource Management Classes

Most of the proposed ADA activity area is located on Public lands and administered by the BLM. These lands have a variety of visual values that are subject to visual resource management objectives as developed using the BLM Visual Resource Management (VRM) System (BLM, 1984, 1986). The BLM system identifies four VRM Classes (I through IV) with specific management prescriptions for each class. The system is based on an assessment of scenic quality, viewer sensitivity, and viewing distance zones.

Scenic Quality

Scenic Quality is a measure of the overall impression or appeal of an area created by the physical features of the landscape, such as natural features (landforms, vegetation, water, color, adjacent scenery, and scarcity), and human-made features (roads, buildings, railroads, agricultural patterns, and utility lines). These features create the distinguishable line, form, color, and texture of the landscape composition that can be judged for scenic quality using criteria such as distinctiveness, contrast, variety, harmony, and balance. The three scenic quality ratings can be described as follows:

- Scenic Quality Class A - landscapes that combine the most outstanding characteristics of the region.
- Scenic Quality Class B - landscapes that exhibit a combination of outstanding and common features.
- Scenic Quality Class C - landscapes that have features that are common to the region.

Viewer Sensitivity

Viewer sensitivity is a factor used to represent the value of the visual landscape to the viewing public, including the extent to which the landscape is viewed. For example, a landscape may have high scenic qualities but be remotely located and, therefore, seldom viewed. Sensitivity considers such factors as visual access (including duration and frequency of view), type and amount of use, public interest, adjacent land uses, and whether the landscape is part of a special area (e.g., Wilderness Study Area or Scenic Area). The three levels of viewer sensitivity can generally be defined as follows:

- High sensitivity - areas that are either designated for scenic resources protection, or receive a high degree of use (includes areas visible from roads and highways receiving more than 45,000 visits [vehicles] per year). Typically within the foreground/middleground viewing distance.

- Medium sensitivity - areas lacking specific, or designated, scenic resources protection, but are located in sufficiently close proximity to be within the viewshed of the protected area. Includes areas that are visible from roads and highways receiving 5,000 to 45,000 visits (vehicles) per year. Typically within the background viewing distance.
- Low sensitivity - areas that are remote from populated areas, major roadways, and protected areas or are severely degraded visually. Includes areas that are visible from roads and highways receiving less than 5,000 visits (vehicles) per year. Typically within the background, to seldom seen, viewing distance.

Viewing Distance Zones

Landscapes are generally subdivided into three distance zones based on relative visibility from travel routes or observation points. The foreground/middleground zone includes areas that are less than three to five miles from the viewing location. The foreground/middleground zone defines the area in which landscape details transition from readily perceived, to outlines and patterns. The background zone is generally greater than five, but less than fifteen, miles from the viewing location. The background zone includes areas where landforms are the most dominant element in the landscape, and color and texture become subordinate. In order to be included within this distance zone, vegetation should be visible at least as patterns of light and dark. The seldom-seen zone includes areas that are usually hidden from view as a result of topographic or vegetative screening or atmospheric conditions. In some cases, atmospheric and lighting conditions can reduce visibility and shorten the distances normally covered by each zone (BLM, 1986).

Visual Resource Management Class System

The VRM Class for a given area is typically arrived at through the use of a classification system that compares relevant visual factors. By comparing the scenic quality, visual sensitivity, and distance zones, the specific VRM class can be determined. The exception to this process is the Class I designation, which is placed on special areas where management activities are restricted (e.g., wilderness areas).

The objectives of each VRM classification as stated in the BLM VRM Visual Resource Inventory Manual are as follows:

- VRM Class I - The objective is to preserve the existing character of the landscape. This class provides for natural ecological changes, however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- VRM Class II - The objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- VRM Class III - The objective is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- VRM Class IV - The objective is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However,

every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic element.

The proposed ADA activity area is located on lands administered by the BLM and subject to VRM management objectives. For some of the BLM-administered lands, VRM classifications have been designated in the appropriate Resource Management Plan (RMP). Other BLM administered lands do not have RMP-approved VRM classifications, as is the case for much of the proposed ADA activity area. Accordingly, "Interim" VRM Classes have been developed by the BLM for lands crossed by the proposed ADA activities and have been classified as VRM Class IV (BLM, 2005e).

3.7 RECREATION

Existing Conditions

As described in the Section 3.5, Land Use, the ground-based portion of the proposed ADA activities would occur on BLM lands within Lincoln County. While the LSA and ADA sites would be located in the vicinity of several recreational areas, the proposed activities would not traverse these recreational areas. The Avenger units that may stop along the roadsides during the live fly phase of the ADA activities would utilize secondary roads, and would not conduct activities adjacent to recreational facilities.

Recreational facilities that are located within the vicinity of the proposed ADA activities include the following:

- **Ash Springs Wildlife Area.** This wildlife area is located adjacent to Ash Springs. As one of the few remaining desert oases in Nevada, the wildlife area is managed by the BLM as a unit of the Desert National Wildlife Refuge Complex, and consists of a spring-fed mineral pool that provides habitat for the endangered white fish. Recreational opportunities include hiking, picnicking and wildlife viewing (DOI, 2004a).
- **Desert National Wildlife Range.** This wildlife range is located south of Alamo. The range was established to preserve habitat for the desert bighorn sheep, and is managed by the USFWS as a unit of the Desert National Wildlife Refuge Complex. Recreational opportunities include camping, horseback riding, environmental education, and wildlife viewing (USFWS, 2004).
- **Key Pittman Wildlife Management Area.** The management area is located south of Hiko. The area is managed by the Nevada Department of Wildlife (NDOW) for the protection of wetlands and waterfowl. Recreational opportunities include boating, hunting, and trapping (NDOW, 2004d).
- **Leviathan Cave Geologic Area.** This area is located in a remote location on the east side of the Worthington Mountain Range. Situated on BLM land, the Leviathan Cave is a series of tunnels and chambers that is visited primarily by spelunkers and geologists.
- **Pahranagat National Wildlife Refuge.** This refuge is located south of Alamo, adjacent to U.S. Highway 93. The refuge was established to provide habitat for migratory birds, and is managed by the USFWS as a unit of the Desert National Wildlife Refuge Complex. Recreational opportunities include boating, fishing, hiking, camping, picnicking, hunting, and wildlife viewing (DOI, 2004a).
- **White River Narrows Archaeological District.** The White River Narrows Archaeological District is located on State Route 318 (SR-318), north of Hiko. White River Narrows is managed by the BLM and is home to cultural artifacts such as petroglyphs. The site was placed on the National Register of Historic Places in 1976 (Lincoln County, 2004a).

Many recreational activities occur on BLM land that is outside of the established recreational facilities listed above. Additional opportunities for recreation include hunting, wildlife viewing, hiking, camping, off-highway vehicle activities, horseback riding, land sailing, rockhounding, recreational mining, and hunting. Hunting and off-highway vehicle activities are described in greater detail below. Recreationists also visit the area to explore the ghost towns and petroglyph sites within Lincoln County, and to observe military activities that are conducted within the area.

Hunting activities within the state of Nevada are managed by the NDOW. Bighorn sheep, mule deer, pronghorn antelope, Rocky Mountain elk, mountain goat, and upland game are hunted throughout this region of the state, and hunters must obtain a license in advance from the NDOW. While the hunting seasons vary for each game species, the seasons generally occur in the fall months. Deer hunting season, which includes archery and muzzle-loading firearms, runs from August through December. Antelope season runs from August to October, elk season runs from September to December, and mountain goat season runs from the third week in August through the third week in October. In addition, there are three species of bighorn sheep in the state that have their own hunting seasons. Hunting season for the Desert bighorn sheep runs from the second week in November to the second week in December, while the first week in September to the first week in October is the season for the California bighorn sheep, and the third week in August to the third week in October is the season for the Rocky Mountain bighorn sheep (NDOW, 2004e).

Off-highway vehicle activities frequently occur east of U.S. Highway 93 in the vicinity of Alamo (BLM, 2005f). Such activities may include off-highway vehicle races, which are often scheduled throughout the year. The Yucca Chuckers M/C race, which is a motorbike race, is scheduled to occur during the proposed ADA activities from March 25-27, 2005 (BLM, 2005g). The race route would begin in vicinity of Ash Springs, and would travel northeast towards Dry Lake Valley in the vicinity of the Pahroc Summit. Near this point the race would cross U.S. Highway 93 and head east towards the community of Caliente paralleling the highway.

3.8 NOISE

Noise Descriptors and Principles

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise can be defined as unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. Sound is created by acoustic energy, which produces minute pressure waves that travel through a medium, like air, and are sensed by the ear drum. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level.

The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary by over one trillion times within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all frequencies within the entire spectrum, noise measurements are weighted more heavily within those

frequencies of maximum human sensitivity in a process called "A-weighting" written as dBA. Designations for sound levels include the minimum and maximum sound levels (Lmin and Lmax), four percentile noise levels (L01, L10, L50, and L90), the equivalent continuous sound level (Leq), and the day-night average sound level (Ldn). The maximum and minimum sound levels are the highest and lowest instantaneous sound levels measured during a single noise event, respectively. Percentile noise levels refer to the sound level that is exceeded for 1 percent, 10 percent, 50 percent, or 90 percent of the time over which the sound is measured. For example, an L90 of 70 dBA means that 70 dBA is exceeded for 90 percent the time for which the measurement was taken. The Leq represents a single value for any desired duration (usually one hour), which includes all of the time-varying sound energy in the measurement period. The Ldn is equal to the 24-hour equivalent sound level (in dBA) with a 10 dBA penalty applied to nighttime sounds occurring between 10:00 p.m. and 7:00 a.m.

The dB scale is logarithmic rather than linear. On a logarithmic scale, the sum of two noise sources of equal loudness is 3 dBA greater than the noise generated by just one of the noise sources (e.g., a noise source of 60 dBA plus another noise source of 60 dBA generate a composite noise level of 63 dBA). The noise level experienced at a receptor depends on the distance between the source and the receptor, presence or absence of noise barriers and other shielding features, and the amount of noise attenuation (lessening) provided by the intervening terrain. For a linear source, such as moving traffic on a road, noise decreases by about 3.0 to 4.5 dBA for every doubling of the distance from the roadway. For point or stationary noise sources, such as a piece of stationary construction equipment, a noise reduction of 6.0 to 7.5 dBA is experienced for each doubling of the distance from the source.

Changes in noise levels are only significant if they are sizable. A 1 dB increase in sound level is considered an imperceptible change, a 3 dB increase is considered a barely perceptible change, and a 5 dB increase is considered a clearly noticeable change (JM, 2005). As such, changes of 5 dB or more are considered significant.

Sensitive Receptors

Some land uses are considered more sensitive to elevated noise levels because of the purpose and intent of the use. Places where people are meant to sleep, or places where quiet is necessary for the function of the land use, are normally considered sensitive. For instance, residential areas, schools, places of worship, and hospitals are more sensitive to noise than are commercial and industrial land uses.

Existing Conditions

Noise measurements were taken in the vicinity of several proposed ADA sites, as well as the LSA. As shown in Table 3.8-1, the primary noise source in the study area is from aircraft overflight originating from NAFB, which is located immediately to the southwest of the ADA activity area. The entire ADA activity area is located within the Nellis airspace boundaries. It should be noted that the air component associated with the proposed ADA activities is considered part of the environmental baseline or existing conditions and would occur whether the proposed ADA activities (i.e., the ground component) occurs or not. Traffic is also a primary noise source for those proposed ADA sites located adjacent to U.S. Highway 93 (Patriot 4).

Table 3.8-1: Measured Ambient Noise Levels Within the Proposed ADA Activity Area

Location	Survey Date	Survey Period	Leq	Max	Min	Notes
LSA	12/21/04	2:05-2:15 p.m.	74.0	86.9	53.6	High winds.
Patriot 1	10/15/04	12:20-12:30 p.m.	51.7	68.8	31.7	Airplanes overhead and wind.
Patriot 3	10/16/04	11:30-11:40 a.m.	45.6	59.0	27.8	Wind.
Patriot 4	10/16/04	9:25-9:35 a.m.	44.5	60.1	32.0	Traffic along U.S. Highway 93. Maximum caused by motor home driving by.
Patriot 101	10/15/04	3:20-3:30 p.m.	62.9	73.5	37.1	Airplanes overhead.
Patriot 103	10/16/04	1:50-2:00 p.m.	59.6	71.0	39.5	Wind.
Patriot 104/104A	10/16/04	3:00-3:10 p.m.	39.7	52.2	32.3	Wind.

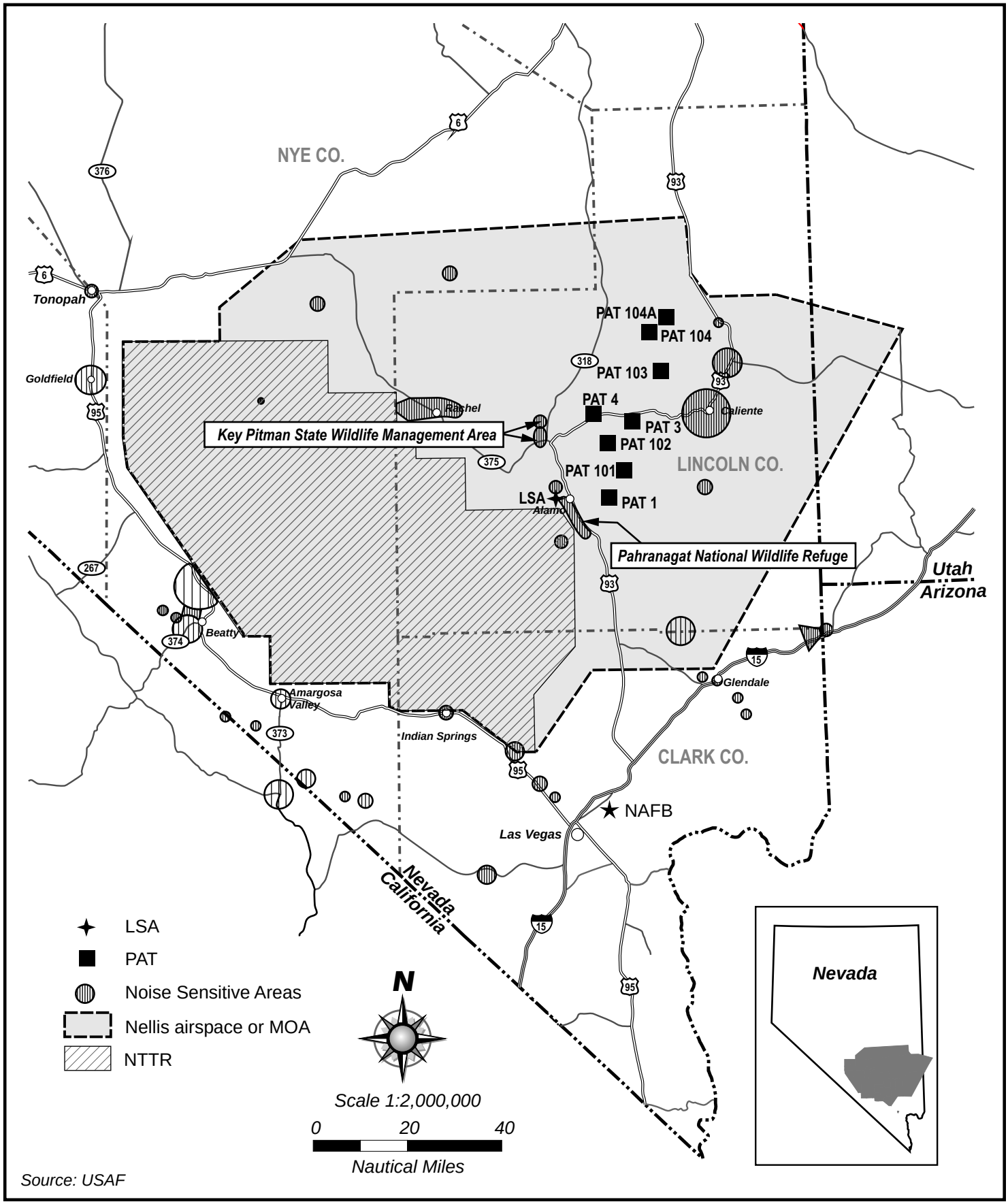
Notes: All measurements are in dBA; Measurements were taken on 15-16 October 2004 and 21 December 2004.
Leq= Equivalent Sound Level, a measurement (in this case 10 minutes) that accounts for the moment-to-moment fluctuations due to all sound sources during the measurement period, combined.
Lmax= The maximum sound level reached during a sampling period.
Lmin= The minimum sound level reached during a sampling period.

The noise levels listed in Table 3.8-1 provide a representative sample of ambient noise conditions in the area of the proposed ADA locations. Noise conditions are described in terms of: Equivalent Sound Level (Leq), the average level of sound determined over a specific period of time (in this case 10 minutes); the maximum sound level (Lmax) reached during a sampling period; and the minimum sound level (Lmin) reached during a sampling period. As described in Table 3.8-1, existing average ambient noise levels at the various sites ranged between 74.0 dBA to 39.7 dBA.

Sensitive Receptors

A land use survey was conducted to identify sensitive receptors in the general vicinity of the proposed ADA sites and the LSA. For the proposed ADA sites, no sensitive receptors were identified. For the LSA (Alamo airfield), vehicles and equipment would travel through a generally well populated area within the community of Alamo on existing residential streets. Access to the LSA site would occur from U.S. Highway 93 using Broadway or 1st Street South. Potential sensitive receptors would include residences (single-family), recreational facilities (baseball fields and tennis courts), the Pahranagat Valley Senior Citizens Center, Alamo Sheriff's office, and Pahranagat Valley Middle School (off 1st Street South). The site itself is located approximately one mile from the closest sensitive receptor (senior center).

Noise Sensitive Areas. The USAF has identified noise-sensitive areas within the ADA activity area, which are excluded from aircraft operations, but would not be excluded from the ground component which comprises the proposed ADA activities. These lands primarily include federal lands managed by the BLM, including the Pahranagat National Wildlife Refuge and Key Pitman State Wildlife Management Area. The communities of Alamo, Rachel, Caliente, Panaca, and Pioche, as well as private lands are also included. These noise-sensitive areas are depicted on Figure 3.8-1.



Source: USAF

Noise Sensitive Areas

Joint Red Flag '05 ADA Activities

Figure 3.8-1

3.9 SOCIOECONOMICS

Existing Conditions

The region of influence for the socioeconomic analysis comprises the area in which ground-based activities and related economic impacts could be expected. The proposed ADA activities would primarily occur within Lincoln County, while transportation of military vehicles would occur within Clark County. Clark County is home to the city of Las Vegas, which contributes to the county's mostly urbanized population. Lincoln County is predominately rural and has the smallest population of the southeastern counties.

There are two Native American Tribes located in Clark County. However, the only tribe that is located within the vicinity of the proposed ADA activities is the Moapa Band of Paiute Indians, situated on the Moapa River Indian Reservation that is southwest of Moapa and west of the Valley of Fire State Park. The reservation is located south of and adjacent to the Nellis airspace, approximately three miles east of U.S Highway 93. No ADA activity would occur in proximity to the Moapa River Indian Reservation.

Population

Of the two counties within the vicinity of the proposed ADA activities, Clark County has the larger population (1,375,765 persons), compared to the population of 4,165 persons in Lincoln County (U.S. Census, 2004a). In the year 2000, approximately 97.7 percent of the Clark County population resided in urban areas such as the city of Las Vegas, while 2.3 percent resided in rural areas. The minority population in Clark County was found to be 28.4 percent of the total population.

During that same year (2000), 100 percent of the Lincoln County population resided in rural areas. The minority population in Lincoln County was found to be only 8.4 percent of the total population (U.S. Census, 2004a).

Of the two counties, Lincoln County has the higher proportion of children (under the age of 20). Children account for approximately 32.8 percent of the population in Lincoln County, while accounting for only 28.0 percent of the population in Clark County (U.S. Census, 2004a).

Employment

According to the U.S. Bureau of Labor Statistics, the September 2004 unemployment rates for Clark and Lincoln counties were 4.0 percent and 6.1 percent, respectively. The statistics indicate that unemployment within these counties is greater than the state's unemployment rate of 3.9 percent (BLS, 2004). The proposed ADA activities would be primarily located in Lincoln County, which has the greatest unemployment rate and is the least urbanized of the southeastern counties.

Housing and Income

In 2000, there were approximately 559,799 total housing units in Clark County and 2,178 units in Lincoln County (U.S. Census, 2004b). These totals include single-family, multi-family, and mobile home residences. Clark County had a vacancy rate of 8.5 percent, while Lincoln County had a housing

vacancy rate of 29.3 percent. The vacancy rate for Lincoln County exceeds the state vacancy rate of 9.2 percent. According to the Federal housing standards, an area with vacancy rates above the Federal housing standard of five percent is not considered to be in short supply of housing (Federal Housing Authority, 2002)

Ethnicity

Table 3.9-1 provides ethnic data for Clark, and Lincoln Counties, and the Census County Divisions (CCD) for Lincoln County. The total provided for each area is the sum of five racial categories: White, Black, Asian, American Indian, and Other. Note that Hispanic is not included in the total for each area, and categories other than Hispanic are considered non-Hispanic.

Table 3.9-1: Ethnic Composition for Clark County and Lincoln County, Nevada

Location	Total Persons	White	Black	Asian	American Indian	Other	Hispanic
Clark County	1,375,765	984,796	124,885	72,547	10,895	182,642	302,143
Lincoln County	4,165	3,811	74	14	73	193	221
Alamo CCD, Lincoln County	1,096	1,020	1	2	15	58	43
Caliente CCD, Lincoln County	1,204	1,057	22	8	37	80	82
Pioche CCD, Lincoln County	1,865	1,734	51	4	21	55	96

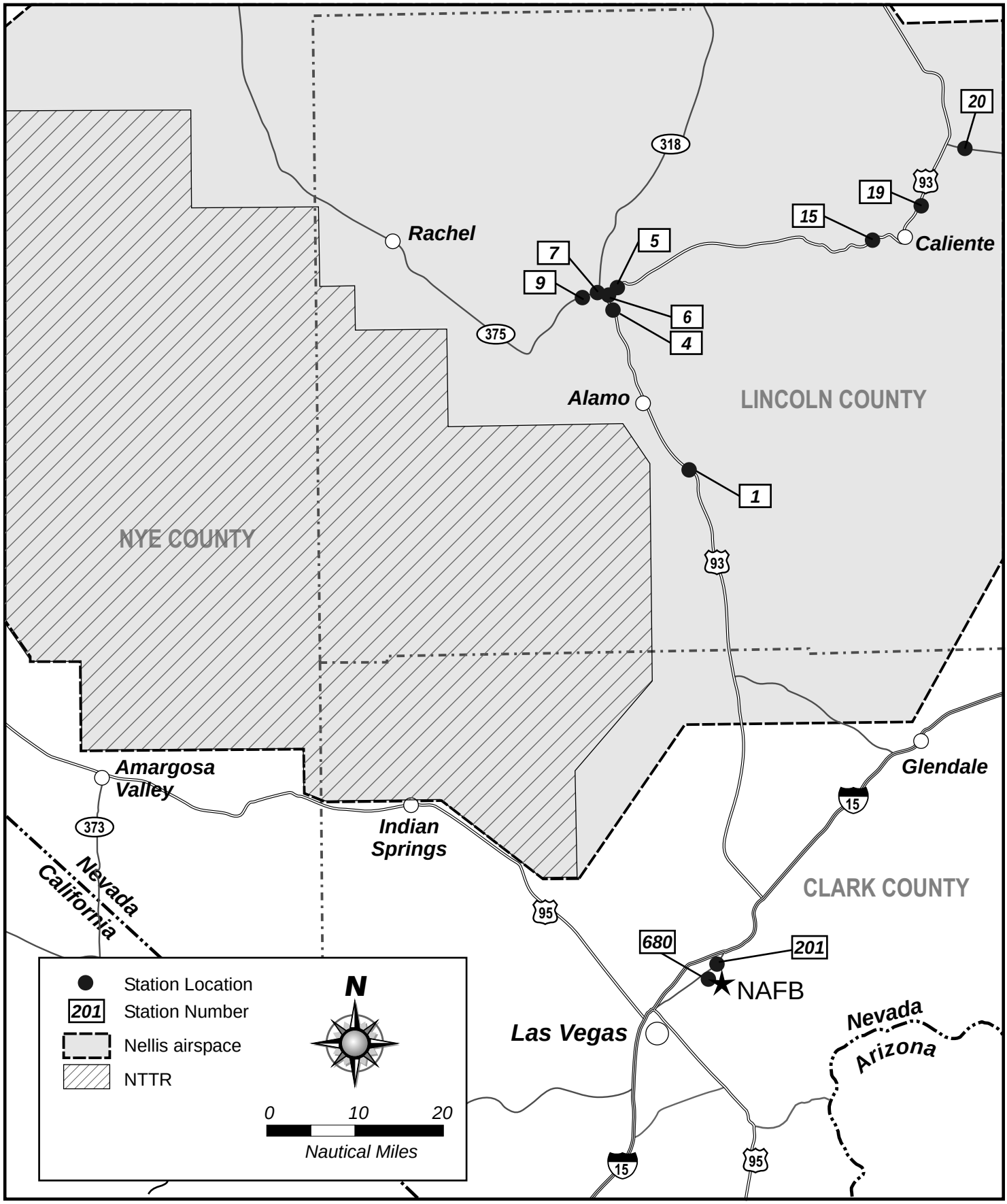
Source: U.S. Census 2004a. Year 2000 data.

3.10 TRANSPORTATION

Existing Conditions

Figure 3.10-1 depicts the major roads in the proposed ADA activity area, other roads and trails are too numerous to depict on this type of figure. The proposed ADA activities would begin as a single convoy heading from NAFB in North Las Vegas to the proposed ADA activity area. Major roadways affected by the proposed ADA activities would include Las Vegas Boulevard (SR-604), I-15, U.S. Highway 93, SR375 and SR-318. These roadways are comprised of two-lanes of asphalt concrete, and are maintained by the State of Nevada Department of Transportation (NDOT).

Las Vegas Boulevard runs in a northeast-southwest alignment through North Las Vegas, Nevada and provides access from NAFB to the highway (I-15). I-15 is the largest highway in the area and runs in a northeast-southwest alignment through Las Vegas, Nevada. U.S. Highway 93 bisects I-15 at Exit 64, and runs in a north-south alignment from North Las Vegas in Clark County, Nevada and into Lincoln County, Nevada where it provides access to the communities of Alamo, Caliente, Panaca, and Pioche. U.S. Highway 93 meets SR-375 and SR-318 in Crystal Springs. SR-375 runs northwest out of Crystal Springs providing access to Rachel before connecting with U.S. Highway 6 at Warm Springs. SR-318 runs north out of Crystal Springs providing access to Hiko before connecting with U.S. Highway 6 just past Preston in White Pine County, Nevada.



Major Roads in the Proposed ADA Activity Area

Joint Red Flag '05 ADA Activities

Figure 3.10-1

Once off the major roadways and outside of Alamo, roads used to access the proposed ADA sites and the LSA are generally comprised of a network of graded rural dirt roads, which are approximately 12 feet wide. Alamo Canyon Road, which provides access to the Delamar Valley from U.S. Highway 93, is representative of these dirt roads and would be used during the proposed ADA activities. Most of these rural roads have very low use, and vehicle movement is free flowing.

Annual average daily traffic volumes measured for the roadways in the vicinity of the proposed ADA activity area are presented in Table 3.10-1. The location of the traffic-count stations are shown on Figure 3.10-1 for reference. Due to the rural nature of the ADA activity area (outside of Clark County), traffic flow in the proposed ADA activity area is good. Some congestion may be experienced around urbanized areas, such as NAFB in North Las Vegas, particularly at peak traffic hours.

Table 3.10-1: Average Annual Daily Traffic on Selected Roadways in the Proposed ADA Activity Area

Station	Location	2003 Daily Traffic Count
	CLARK COUNTY	
201	SR-604 (Las Vegas Blvd.), 100 feet north of Checker Flag Ln.	3,600
680	SR-612 (Nellis Blvd.), 0.1 mile south of SR-604 (North Las Vegas Blvd.)	21,300
	LINCOLN COUNTY	
1	US-93, at mp LN-25 South of Alamo	1,600
4	US-93, 0.6 miles south of SR-318 near Crystal Springs	1,650
5	US-93, 0.1 miles north of SR-375	600
6	SR-318 (Sunnyside Cutoff Rd.), 0.1 miles west of US-93 near Crystal Springs	1,350
7	SR-318 (Sunnyside Cutoff Rd.), 1.6 miles north of SR-375	1,250 (estimated)
9	SR-375 (Warm Springs Rd.), 0.7 miles west of SR-318 at Crystal Springs	210
15	US-93, 0.5 miles south of SR-317 in Caliente	680
19	US-93, near the northern city limits of Caliente, 0.1 miles north of mp 95	1,450
20	County Rd. to Beaver Dam State Park, North of Caliente, 0.2 miles east of US-93	90

Source: NDOT, 2003.

3.11 HAZARDOUS MATERIALS AND WASTE HANDLING AND DISPOSAL

This section addresses safety issues associated with the activities that would occur during the proposed ADA activities. Ground safety considers issues associated with operations and maintenance activities that support the proposed ADA activities, including fire and crash response. Since no live firing from the ground or air would be included in the proposed ADA activities, radar systems would be employed.

3.11.1 Fire Risk and Management/Ground Safety

Ground-base activities would generally occur on BLM lands in the Nellis airspace. In the event of a fire and/or crash, BLM has primary responsibility for suppression of wildland fires within the ADA activity area. In Lincoln County, various community fire departments, such as Alamo, Caliente, Panaca, and Pioche, would also be available as additional response support. While the majority of the proposed ground-base activities would take place within Lincoln County, all vehicles and equipment for the proposed ADA activities would begin at NAFB in Clark County. Within Clark County, the Clark County Fire Department, which is comprised of 24 fire stations with paid employees and 13 volunteer fire stations (CCFD, 2004), would be available in the event of a fire and/or crash. Additionally, the

U.S. Army would coordinate with the NAFB military fire department to work out support agreements for providing crash response to those areas that are close to NAFB.

The handling, processing, storage, and disposal of hazardous by-products from ground-based activities would be accomplished in accordance with all federal and State requirements applicable to the substance generated. Additional specific data pertaining to hazardous material and solid waste are contained in Section 3.11.2.

Radio Frequency Emissions

To provide training realism, threat simulation electronic emitters (radars) would be located throughout the proposed ADA activity area. The frequencies at which radars operate are in the radio frequency (RF) band of the electromagnetic spectrum. Potential effects of RF energy on biological species are discussed below.

RF energy is absorbed macroscopically by an animal or human body in the form of heat and is defined as an increase in the mean kinetic energy of the molecules. The result is a temperature increase. At relatively low RF energy intensities, the heat induced can usually be accommodated by the thermoregulatory capabilities of the species exposed. Thus, any effects produced would generally be reversible. At high intensities, the thermoregulatory capabilities of any given species may be exceeded, which could lead to thermal distress or even irreversible thermal damage.

The effects of RF energy on people depend on the frequency and polarization of the energy field, the size and shape of the individual, and the individual's ability to dissipate the absorbed energy by a normal biological response. Department of Defense Instruction (DoDI) 6055.1 (1995) has set the permissible exposure limit (PEL) for personnel. These PELs represent conditions under which it is believed that humans may be repeatedly exposed without adverse effects, regardless of age, sex, or childbearing status. Depending on the RF frequency, the PEL for personnel working in a designated controlled environment where the emitter is operating is 10 milliwatts per square centimeter (10 mW/cm^2) over any continuous 6-minute period. For persons in an uncontrolled environment (i.e., the public), the PEL is 5 mW/cm2 over any continuous 6-minute period. Repetitive exposures to these levels (that are less than 6-minutes each) are not expected to be harmful. Most studies have shown that, in general, people can actually be exposed to up to 10 times the above-stated PEL without any harmful health effects.

Accident Response

NAFB Safety Offices maintain detailed mishap response procedures to respond to a wide range of potential incidents. These plans assign agency responsibilities and prescribe functional activities necessary to react to major mishaps, whether on or off the base. Response would normally occur in two phases. The initial response includes rescue, evacuation, fire suppression, safety, and elimination of explosive devices, ensuring security of the area, and other actions immediately necessary to prevent loss of life or further property damage. Subsequently, the investigation phase is accomplished. The initial response element consists of those personnel and agencies primarily responsible for beginning the

initial phase. This element includes the Fire Chief, who normally is the first on-scene commander, fire fighting and crash rescue personnel, medical personnel, security police, and crash recovery personnel. A subsequent response team is comprised of an array of organizations, whose participation is governed by the circumstances associated with the mishap, and actions required to be performed. If an aircraft accident occurs on non-federal property, regardless of the agency initially responding to the situation, as soon as the situation is stabilized, a National Defense Area would normally be established around the accident scene. The site would be secured for the investigation phase. After all required investigations and related actions on the site are complete, the aircraft would be removed. The base civil engineer accomplishes cleanup of the site or contracts to an outside agency to accomplish the cleanup. Overall, the purpose of response planning is to: save lives, property, and material by timely and correct response to mishaps; quickly and accurately report mishaps to higher headquarters; and investigate the mishap to preclude the reoccurrence of the same or a similar mishap.

3.11.2 Hazardous Materials and Solid Waste

Existing and past land use activities are used as potential indicators of hazardous material storage and use. For example, many industrial sites, historic and current, are known or suspected to have soil or groundwater contamination by hazardous substances. Properties devoted to oil production, including oil fields and processing facilities, are commonly known or suspected to have environmental contamination from petroleum hydrocarbons, heavy metals, and chlorinated solvents. Other hazardous materials sources include leaking underground tanks in commercial and industrial areas, surface runoff from contaminated sites, and pesticides and herbicides in the soil of past agricultural lands. In addition to contaminants found in soils, groundwater is subject to contamination associated with underground storage tanks and other sources.

Environmental Setting

The proposed ADA activity area includes BLM land that is generally undeveloped and one air field/landing strip located on private lands (Alamo airfield). The proposed ADA activities would not require long-term storage, treatment, disposal, or transport of substantial quantities of hazardous materials; however, small quantities of hazardous materials would be stored, used, and handled during the proposed ADA activities. The hazardous materials that would be used during the proposed ADA activities are small volumes of petroleum hydrocarbons and their derivatives (e.g., diesel, gasoline, oils, lubricants, and solvents) required to operate the Patriot, Avenger, and Sentinel units, generators, mobile field kitchens, vehicles, etc. Fuel would be stored on Patriot sites and at the LSA for the duration of the ADA activities. Avenger units would be serviced by fuel trucks approximately four times during the ADA activities. Portable toilets would also be placed at each ADA site. Additionally, copper grounding rods, which can be 12 feet long and buried upright within inches of the surface, may be used to ground electrical equipment.

The proposed ADA activities would occur in a largely undeveloped area. A search of the USEPA Envirofacts Data Warehouse, which provides information on superfund (CERCLA), toxic releases (TRI), and hazardous waste sites, was conducted for those counties that may be affected by the proposed ADA activities (i.e., Lincoln and Clark Counties). Based on a search of the USEPA

Envirofacts Data Warehouse, Table 3.11-1 presents the summary of superfund, toxic release, and hazardous waste sites identified within the vicinity of the proposed ADA activities area. These potentially hazardous facilities are not located on or adjacent to the proposed ADA sites or the LSA.

Table 3.11-1: Superfund, Toxic Release, and Hazardous Waste Sites Identified in the Vicinity of the Proposed ADA Activity Area

Site	Location	Handler Type	Type
CLARK COUNTY			
Amer Tele & Tele Co Arrow Canyon	12.4 miles SW of Moapa	Unknown	Hazardous Waste
LINCOLN COUNTY			
Union Carbide Corporation	Star Route, Tempiute	Unknown	Hazardous Waste
Chevron USA Inc. Caliente, Bulk Plant	U.S. Highway 93, Caliente	Unknown	Hazardous Waste
Dalton Robert & Sons#	10 miles W on Dalton Rd., Pioche	Unknown	Hazardous Waste

Source: USEPA, 2004c.

The Nevada Division of Environmental Protection, Bureau of Corrective Actions, provides a listing of leaking underground storage tanks (LUST) and corrective action (non-regulated) sites as of July 30, 2004. Based on this information 41 sites were identified in Lincoln County; and 120 sites in North Las Vegas, Clark County (NDEP-BCA, 2004a). None of the proposed ADA sites or the LSA would be located on a LUST or corrective action site.

A government records search was also conducted to identify hazardous materials sites listed pursuant to Government Code Section 65962.5. Environmental Data Resources, Inc. (EDR) conducted a search, specifically for the area east of Crystal Springs. Based on the EDR database search, three underground storage tanks (UST) were identified in the area (EDR, 2004). UST sites are registered with the Nevada Department of Conservation and Natural Resources as required by the Resource Conservation and Recovery Act (RCRA). This does not mean that the storage tanks are leaking or contain hazardous waste.

In addition, one correction action site, which is also listed with the Department of Conservation and Natural Resources, was identified. This listing is for an accident involving Sherman Brothers Trucking, which occurred on SR-318 near U.S. Highway 93 (EDR, 2004). However, this site was cleaned up and the case was closed on 13 August 2002 (NDEP-BCA, 2004b). As such, none of proposed ADA sites or the LSA would be located on or near a potential hazardous waste site.

Furthermore, the great majority of the non-weapon hazardous materials used by the USAF, U.S. Army, and contractor personnel are controlled through a pollution prevention process called HAZMART, or hazardous pharmacy. This process provides management for the procurement, handling, storage, and issuing of hazardous materials and the turn-in, recovery, reuse, recycling, or disposal of hazardous wastes. The HAZMART process includes review and approval by USAF or U.S. Army personnel to ensure users are aware of exposure and safety risks. After the request for the issue of hazardous material is approved, the user picks up the material from the hazardous material storage area. The user then transports the hazardous material directly to the work site or to a hazardous material storage site. HAZMARTs also arrange for the proper disposal of waste.

3.12 CULTURAL RESOURCES

3.12.1 Existing Conditions

The proposed ADA activities would mobilize from NAFB in Clark County and would be distributed throughout a large area within Lincoln County. The ADA activity area includes a large portion of Lincoln County which is at the boundary of the northern Mojave Desert and the southern Great Basin, and a portion of Clark County both in and north of Las Vegas Valley. While the proposed ADA activity area is located in the transition zone between the northern Mojave Desert and the southern Great Basin, it is known as the Great Basin for purposes of cultural resources investigations. The Great Basin culture area comprises a variety of physiographic and ecological regions. Great Basin cultures in historic times were known to have occupied all of the various regions. The proposed ADA activities are restricted to the valley and exclude the high ground ecological zone.

3.12.2 Cultural Resources

Cultural resources are districts, sites, buildings, structures, or objects that may be considered to be important to a culture for scientific, traditional, religious or any other reasons. Cultural resources fall into three main categories: archaeological, architectural, and traditional cultural properties. Archaeological resources are defined as loci, where human activity has perceptibly modified the earth or left material deposits either buried or surficial. Archaeological resources are sorted into two categories in Nevada, either isolated finds or sites. Isolated finds are loci that produce one artifact and no features (i.e., a hearth, foundations, rock alignments). Sites are loci that produce two or more artifacts or a feature.

Architectural Resources

Architectural resources are standing buildings, facilities, and other structures having historical, aesthetic or scientific significance. Architectural resources are normally a component of the historic period and are discussed below (Historic section). Prehistoric rock alignments while containing structural features would not be considered an architectural resource. These features would be considered an archaeological resource and possibly a traditional cultural resource.

Traditional Cultural Resources

Traditional cultural resources are places or things that are associated with beliefs and/or practices of a living community and are important to its cultural identity. Traditional cultural resources can be loci of important events, sacred areas, sources of important raw materials, meeting areas, or prominent topographical features. A traditional cultural resource is necessarily defined by the subject living community.

Prehistoric

The prehistory of the Great Basin begins with the Pre-Archaic at circa 11,000 – circa 7000 B.C. This period is defined by lithic artifacts known as Clovis projectile points, but these are found only on the surface and can be dated only by comparison to artifacts from other areas of the Southwest. People of

this period were big game hunters and were therefore highly mobile. Concurrent with this period there was a shrinking of what are now dry lake beds and a disappearance of rivers. Rising temperatures and aridity characterized the time after the Pre-Archaic. The Pre-Archaic of the southeastern Great Basin is represented by a small number of Clovis projectile point surface finds. There is, in fact, minimal evidence for human occupation in this period.

The Pre-Archaic is followed by the Archaic (or Desert Archaic) beginning circa 7000 B.C. and lasting into the historic period (post A.D. 1776). The Archaic period in the southeastern area dates from circa 7000 B.C. to circa A.D. 500. Most Archaic period sites appear to be seasonally occupied resource procurement sites, which is a pattern in the Great Basin as a whole. While intensive surveys have not been conducted in the ADA activity area and much of the data comes from rockshelter sites (i.e., a different ecological zone), it can be said that prehistoric cultures exploited the area from at least circa 11,000 B.C., and sites should be expected in the valleys, especially along relict lake shorelines. Prehistoric resources could include isolated stone tools (i.e., arrowheads, scraping or other food processing tools of stone), rock alignments, habitation sites, and rock art sites.

Three sequential cultural traditions are recognized in the southeastern Great Basin. These are Archaic (7000 B.C.-A.D. 500), Horticultural (A.D. 1-1200), and Shoshonean (A.D. 1000-historic times). The earliest settlement patterns are not well known, but association with riverine and lacustrine resources is documented. By the time of the Horticultural tradition, reliance began to move towards cultigens necessitating semi-sedentary to sedentary villages certainly associated with permanent stream courses. Exploitation by hunting and gathering took place in the upland regions. The Shoshonean tradition was supported primarily by hunting and gathering. This tradition continued into historic times (i.e., post 1776).

Historic

The exploration parties of Garces (1775-1776) and Dominguez-Escalante (1776-1777) both ranged close to the proposed ADA activity area in the Spanish period (before 1821), but close contact between Europeans and the Great Basin native Americans did not occur until the mining activities in the American period (after 1848). Sites that may be expected in southern Nevada would be camp sites, railroads, power lines, fences, buildings, dumps, mining sites, pioneer trails, and other architectural features.

Several known cultural resources occur in the vicinity of the proposed ADA sites. ADA activities would avoid areas containing cultural resources.

3.13 UTILITIES

The communities surrounding the proposed ADA activity area have existing utility infrastructure systems similar to most rural Nevada communities. The following section briefly describes the existing utility infrastructure as identified during the site visits conducted between 15-17 October 2004 and 21-22 December 2004.

Existing Conditions

Because government agencies have recently categorized data pertaining to utility systems (including their location, capacity, and type) as sensitive, critical infrastructure information, public access to these data has become restricted for security reasons. As such, only information that continues to be made public and is readily accessible is presented in this section. While this specific data would provide a better picture of the existing utilities within the proposed ADA activity area, in large part, this level of detail is unnecessary for the level of analysis needed to determine the impacts generated by the proposed ADA activities.

The proposed ADA activity area is served by the utility providers listed in Table 3.13-1.

Within the proposed ADA activity area, specifically Lincoln County, a utility corridor runs along U.S. Highway 93 and heads north-northeast through the Delamar Valley and Dry Lake Valley up to the City of Pioche and beyond. The Patriot 1 site would be located directly adjacent to and/or within this utility corridor. ADA sites Patriot 1, 101, and 103 would be located near this utility corridor. In this utility corridor, overhead electrical transmission lines exist, as well as underground fiber optic cable (FOC) lines. In this area, the main power line is used by Lincoln County Power District. There are two FOC lines, one of which is owned by Lincoln County Telephone System, Inc., and the other is owned by Wiltel, which passes through Lincoln County, but does not service the area (LCBPD, 2004 and PUCON, 2004).

Table 3.13-1: Utility Providers in Lincoln County, Nevada

Utility	Provider
Natural Gas	No infrastructure or suppliers. Bottled gas (propane) is available from private distribution companies in the area.
Electricity	Lincoln County Power District Alamo, Caliente, and Pioche provide their own power, which is purchased from Lincoln County Power District. Panaca Power and Light Company South Panaca Power Group
Water/Sewer	Alamo, Caliente, Panaca (Panaca Farmstead Bureau), and Pioche (Pioche Public Utilities) provide their own water/sewage facilities
Fire Protection	Volunteer Fire Departments are located in the communities of Alamo, Caliente, Panaca, and Pioche BLM Wildfire Dispatch Office
Police Protection	Lincoln County Sheriff's Department Nevada Highway Patrol
Telephone	Lincoln County Telephone System, Inc.

Source: Lincoln County, 2004b; LCBPD, 2004; and PUCON, 2004.

An additional utility corridor located in the proposed ADA activity area runs east-west, across U.S. Highway 93 near Crystal Springs and heads west towards Tempiute. The only other utility identified during the site visits includes a NDOT Traffic Counter Buried Cable (FOC) on the west side of U.S. Highway 93, running parallel to the highway (north-south alignment), near the intersection of U.S. Highway 93, SR-375, and SR-318.

4.1 AIR QUALITY

4.1.1 Significance Criteria

Air quality impacts would be considered significant if they were to: (1) conflict with or obstruct implementation of the CCDAQM Nonattainment Area Plans or other relevant portions of the Nevada State Implementation Plan (SIP); (2) would violate any air quality standard or contribute substantially to an existing or projected air quality violation, whether solely or cumulatively; or (3) result in non-compliance with the Federal General Conformity Rule (40 CFR Parts 93, Subpart B).

4.1.2 Proposed Action

The proposed ADA activities would result in very short-term (two weeks or less) air quality impacts due to diesel exhaust emissions from vehicle transport, vehicle idling, portable generator use, and minor emissions from support activities such as cooking and diesel refueling operations. Table 4.1-1 provides a conservative estimate of the total maximum emissions for the proposed ADA activities. Refer to Appendix A.1 (Air Quality) for the methodology, assumptions, and emission factors used to estimate emissions.

Table 4.1-1: Estimated Emissions for the Proposed ADA Activities (tons)

Emission Location	NOx	CO	VOC	SOx	PM_{10}
Clark County Emissions	0.18	0.02	0.01	0.00	0.33
Lincoln County Emissions	2.81	0.55	0.15	0.03	20.19
Total Emissions	2.99	0.58	0.15	0.03	20.52

The activities and emissions that would occur under the proposed ADA activities would in no way conflict with or obstruct implementation of the current CCDAQM Nonattainment Area Plans or other relevant portions of the State of Nevada SIP. The proposed ADA activities that would occur within the nonattainment area would be conducted in compliance with all CCDAQM rules and regulations and the emissions from the proposed ADA activities would occur over a short duration and would not be of a quantity that would significantly contribute to any air quality exceedance within the Las Vegas Valley nonattainment areas or cause any new monitored exceedance of any air quality standard. The proposed ADA activities conducted within Lincoln County would not be of a duration or quantity that would affect the attainment status of Lincoln County for any criteria pollutant.

The majority of the emissions associated with the proposed ADA activities would occur either in transit, which limits the impact at any one location, or would occur at remote sites in Lincoln County that should not have the potential to expose sensitive receptors to substantial concentrations of pollutants. There may be the potential for short-term adverse impacts to recreational users and a few area residents due to emissions accumulating during low level temperature inversions, or from dust emissions that may occur during convoy travel on unpaved roads. Additionally, at a few of the proposed ADA locations, the potential for dust emissions may be exacerbated by the fine soil conditions that occur (i.e., near dry lake beds). However, SOPs would reduce, to the extent feasible, the related emission potential, particularly diesel idling emissions and fugitive dust emissions from travel on unpaved road surfaces.

The emissions from the proposed ADA activities, within the Las Vegas Valley PM10 and CO nonattainment areas, are well below the General Conformity Rule *de minimis* annual emission threshold of 70 tons per year of PM10 and 100 tons per year of CO. Please refer to Appendix A.2 for the complete conformity analysis. County specific emissions were developed for the proposed ADA activities in order to complete the conformity determination. Only the Proposed Action undergoes a conformity determination, so county specific emissions for the alternatives were not estimated. The Clark County emissions for each alternative would be similar in proportion to those shown in Table 4.1-1 and would be well below the General Conformity Rule *de minimus* annual emission thresholds.

In conclusion, no significant air quality impacts would occur from the proposed ADA activities with implementation of SOPs.

4.1.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed ADA activities would not be implemented, thereby avoiding all potential air quality impacts that would have been associated with it, including air pollutant emissions associated with on-road vehicle travel, paved and unpaved road dust, and diesel generator use. Therefore, implementation of the No Action Alternative would not result in any air quality impacts.

4.1.4 Alternative B: Reduced Scope of ADA Activities

Alternative B would result in similar but reduced air quality impacts as the Proposed Action. Table 4.1-2 provides a conservative estimate of the total maximum emissions for this alternative. Refer to Appendix A.1 (Air Quality) for the methodology, assumptions, and emission factors used to estimate emissions.

Table 4.1-2: Estimated Emissions for Alternative B (tons)

Emission Location	NOx	CO	VOC	SOx	PM_{10}
Total Emissions	1.67	0.34	0.09	0.02	10.34

The overall emissions estimated for Alternative B are lower than those estimated for the Proposed Action and would be lower at any given fixed ADA site due to the reduction in forces/equipment that would be transported to and used at each of the proposed ADA sites. Therefore, similar to the Proposed Action, this alternative would not result in any significant air quality impacts.

4.1.5 Alternative C: Elimination of Potential ADA Sites

Alternative C would result in similar but reduced air quality impacts as the Proposed Action. Table 4.1-3 provides a conservative estimate of the total maximum emissions for this alternative. Refer to Appendix A.1 (Air Quality) for the methodology, assumptions, and emission factors used to estimate emissions.

Table 4.1-3: Estimated Emissions for Alternative C (tons)

Emission Location	NOx	CO	VOC	SOx	PM_{10}
Total Emissions	2.74	0.54	0.14	0.03	15.65

The overall emissions estimated for Alternative C are lower than those estimated for the Proposed Action due to the reduction in ADA sites; however, the emissions at any given fixed ADA site would be similar to the Proposed Action. Therefore, this alternative would not result in any significant air quality impacts.

4.2 BIOLOGICAL RESOURCES

4.2.1 Significance Criteria

Significant impacts to biological resources would occur if the proposed ADA activities resulted in the removal or disturbance of special status plants or habitat, loss or degradation to sensitive natural plant communities, diverting or channeling surface water flows, filling wetland habitats, severing or degrading wildlife corridors, or encroaching into wetland buffers or sensitive habitats. Direct impacts would occur when sensitive biological resources are altered, disturbed, destroyed, or removed during the course of the proposed ADA activities. Direct impacts would result from such activities as removal, grading, or brushing of vegetation, or mechanical crushing from equipment and vehicles. Other direct impacts could include loss of foraging, nesting, or burrowing habitat for wildlife species, and habitat disturbance that results in unfavorable substrate conditions to allow vegetative regeneration or results in the introduction of exotic invasive species.

Indirect impacts occur when exercise-related activities affect biological resources in a manner other than direct impacts. Potential indirect impacts resulting from implementation of the proposed ADA activities include elevated noise levels, light, increased erosion and sedimentation, and the production of fugitive dust emissions. These changes may in turn affect vegetation communities and sensitive species.

Both direct and indirect impacts can be classified as either temporary or permanent, depending on the duration of the impact. Temporary impacts may be considered to have reversible effects on biological resources. Permanent impacts are those impacts resulting in the irreversible removal of biological resources. No permanent impacts are expected to occur as a result of the proposed ADA activities.

4.2.2 Proposed Action

Activities that could result in impacts to biological resources in the ADA activity area and at each of the proposed ADA sites include the placement of equipment and personnel, training activities during the activity period, and off-road vehicle use to gain access to the ADA sites. Overland travel impacts required to position equipment at each ADA site would vary in magnitude depending on variables such as vegetation type, soil morphology, topography, unit size, and types of vehicles. No habitat removal would occur at any location, and only existing roads would be used to access the ADA sites. Blading, clearing vegetation, excavation of any type, or new road development would not occur.

The proposed ADA activities could result in temporary damage to existing vegetation, but would not involve the removal or substantial disruption of surface soil layers. The most common type of surface disturbance would be caused by rubber tired vehicles moving onto the ADA sites in order to move

personnel and equipment into the proposed ADA activity area. Existing vegetation would be crushed in place and the root system left intact.

Appendix C.1 contains a vegetation map, concise site description, and photograph of representative habitat that occurs at each of the proposed ADA sites and in the areas adjacent to the LSA. In total, the fixed Patriot ADA sites cover a maximum area of approximately 2,000 acres. Avenger and Sentinel units would remain on or within a 50 meter (164 foot) radius of existing access roads and are expected to have limited potential for disturbance. The LSA would be located on the dirt airfield west of Alamo, and would not result in any impact to vegetation or habitat.

4.2.2.1 Vegetation

Each of the proposed Patriot sites consists of up to 247-acres of vegetation. Potential impacts to vegetation at each ADA site would be different based on existing biological conditions and equipment use. Most of the vegetation located on the proposed ADA sites consists of common plant communities that are not regionally unique, provide limited foraging value, and are widespread throughout the proposed ADA activity area. Several of the proposed ADA sites are primarily barren, such as the playa area at Patriot 1, the dirt airfield at Patriot 3, and the barren areas that comprise some of the area at Patriot sites 101 and 102. Other sites contain populations of disturbed habitat dominated by invasive plant species such as Russian thistle. Plant communities which serve an important role to wildlife and cattle by providing a vital food source (i.e., winterfat/white sage) would be avoided. In addition, winterfat/white sage communities are more susceptible to disturbance and colonization by invasive plants than other plant communities in the area. Although some of the sites occur in areas that support grazing opportunities, only a limited portion of any site would be disturbed by the proposed ADA activities. Vegetation communities on each of the proposed ADA sites and adjacent to the LSA have been identified in Section 3.2 and in Appendix C.1.

As previously stated, not all of the plant communities that could be affected by the proposed ADA activities are equally sensitive to surface disturbance, not all of these impacts would occur in every plant community, and in some instances most of the existing vegetation at the site would be avoided. In many cases, equipment could be positioned between existing vegetation or in areas lacking substantial vegetative cover. Some of the Patriot sites would be located in areas containing little substantial vegetative cover such as disturbed grasslands, airfields, and scrub communities. Similarly, access to each site would be limited to existing paved or dirt roads maintained by the county. To further minimize potential impacts, troops and equipment utilizing the Patriot sites would be emplaced within a one-quarter km^2 (60 acres) section of the approved site.

Avenger units would limit activity to within 50 meters (164 feet) of known roads (outside of desert tortoise habitat), would avoid parking on heavily vegetated areas, and would bivouac only at the designated Patriot sites or the LSA. Depending on the field locations of the mobile Avenger units, single vehicles could travel in basin sagebrush, winterfat, or Mojave scrub communities, although site disturbance would be minimal and limited to single vehicles in these areas.

Due to the measures incorporated into the proposed ADA activity description, the SOPs (no digging, no clearing of vegetation, site inspections, after action review by BLM to determine restoration requirements if needed, and environmental training), the implementation of the environmental criteria (no brush clearing, avoid all impacts to cacti and Joshua trees), and the relative abundance of these communities in the region, impacts to vegetation would be relatively low. Given the temporary nature of the ADA activities and the use of rubber tired vehicles, impacts to these communities may be adverse but are not expected to result in significant loss or alteration of range land communities. If after consultation with the BLM and the U.S. Army, reclamation activities are required at any of the proposed ADA sites, the U.S. Army would coordinate the reclamation effort within one year of the inspection.

Noxious Weeds

Implementation of the proposed ADA activities could result in the potential to increase the spread of noxious weeds at the proposed Patriot sites. Disturbance from vehicles and equipment could result in the spread of invasive species such as Russian thistle, halogeton, and brome grasses. Noxious weeds could also spread to other areas by vehicle use in areas that may contain populations of noxious weeds. Although no plants listed on the noxious weed list were identified at the proposed ADA sites, three populations of noxious weeds were identified by the BLM as occurring in the Dry Lake Valley (BLM, 2005b). These sites would be flagged for avoidance during the proposed ADA activities to prevent Avenger units from entering these areas. Through the implementation of SOPs, including the identification and flagging of populations of noxious weeds for avoidance, post inspection by the BLM, and seeding with native species if required, impacts from the spread of noxious weeds may be adverse but less than significant. In addition, all vehicles and heavy equipment used for the proposed ADA activities that are authorized for off-road driving, or that come into contact with plant species listed on the Nevada Noxious Weed list or specifically identified by the BLM Ely Field Office, would be cleaned prior to continued use in weed-free areas. If the spread of noxious weeds is noted, appropriate weed control procedures would be determined in consultation with BLM personnel and the U.S. Army. Any remedial actions undertaken would be in compliance with the appropriate BLM Handbook sections and applicable laws and regulations.

Wetlands and Riparian Habitat

Ground activities associated with the proposed ADA activities would not occur within one-quarter mile of riparian or wetland habitat. In addition, no activities would be conducted in standing or ponded water, and if present, the ADA location would be avoided (see Section 4.3, Water Resources and Hydrology).

Wilderness Areas and Areas of Critical Environmental Concern

Ground activities associated with the proposed ADA activities would not occur in designated wilderness areas or areas of critical environmental concern. No impacts to these resources would occur.

4.2.2.2 Wildlife

Implementation of the proposed ADA activities has the potential to temporarily disrupt wildlife habitat by the introduction of military equipment onto the proposed ADA sites. The primary form of disturbance would result from crushed vegetation and potential loss of individual animals. This type of disturbance would most likely affect wildlife in Basin sagebrush, blackbrush, and Mojave scrub communities. However, the proposed ADA activities would be of short duration, some of the sites provide minimal foraging value, and potential activity-related disturbance would occur in a limited area. With the exception of some small mammals and reptiles, most species would likely move to adjacent habitat during the proposed ADA activities. Large mammals, including mule deer and coyotes, are wide ranging species and would not be adversely affected by the proposed ADA activities. Therefore, impacts to existing wildlife habitat would be less than significant.

Indirect impacts resulting from human disturbance at the proposed ADA sites could cause displacement of some wildlife to other habitats. Elevated noise levels, light from stationary equipment, and the production of fugitive dust emissions could also occur. However, it should be noted that most the temporary increases in noise would occur from the ongoing air activities. Impacts as a result of increased human disturbance may also include reduced reproductive success in local wildlife populations, such as small mammals and reptiles. Burrows could also be disturbed and abandoned as a result of increased human disturbance. However, most of the proposed ADA sites are located in areas that support common species, and although adverse to small mammals and reptiles, impacts would be less than significant.

Wild Horses

Wild horses could be temporarily affected by the placement of ADA units, vehicle travel, and associated noise from aircraft that occurs in or adjacent to the HMAs. However, none of the eight potential Patriot sites that could be utilized during the proposed ADA activities or the LSA are located in a designated HMA. In addition, only two of the proposed eight Patriot sites and the CCC would be used during the proposed ADA activities at any given time. Mobile units could travel in the Rattlesnake and Delamar Valley HMA, in the very southern portions of the Seamans, and possibly in the Dry Lake Valley HMA. No other HMA would be affected by the proposed ADA activities. Horse movement would not be affected. It is possible that a small number of wild horses could be temporarily disturbed during implementation of the proposed ADA activities. In addition, the exercise could occur during the foaling season for wild horses. However, the exercise would not result in a permanent loss or disruption of foraging land for wild horses. To reduce the potential for disturbance to wild horses, all personnel conducting the exercise would be advised to reduce speeds if wild horses are observed along the access roads. Due to the wary nature of wild horses, the short duration of the exercise, and the large geographic region, it is not expected that the proposed ADA activities would result in significant impacts to wild horses.

Migratory Birds

The proposed ADA activities would not occur during the identified "no activity" period for migratory birds. Therefore, impacts are not expected to occur from implementation of the proposed ADA activities.

4.2.2.3 Special Status Species

Vegetation

No threatened or endangered plants were observed at the proposed ADA sites during the biological surveys (15-17 October 2004 and 21-22 December 2004), or are expected to occur in the proposed ADA activity area. Nine special status plants have the potential to occur in the area of the proposed ADA activities, but only three are likely to occur on any of the proposed ADA sites. Federal and BLM listed species of concern with the potential to occur in the proposed ADA activity area include Eastwood milkweed, Beatley's phacelia, and Parish's phacelia. Eastwood milkweed has been identified in several locations across the region, and was identified within one mile of ADA site Patriot 4 and three miles from ADA sites Patriot 104 and 104A. This long-lived perennial grows from a buried root crown and prefers alkaline soils in barren areas lacking competition from other plants. It frequently occurs in small washes or other moisture rich micro-sites (NDOW, 2004b). This plant is not expected to occur at the proposed ADA sites and was not observed during the October and December surveys. Although surveys for this species occurred outside the preferred floristic period for this species, no dried milkweed or similar species was identified on the proposed ADA sites.

Parish's phacelia is primarily limited to sparsely vegetated alkaline flats, generally in dry, cracked mud flats of seasonal pools filled in years of high rainfall. Beatley's phacelia occurs within Parish's phacelia's range in southern Nevada, but Beatley's phacelia is more likely to occur on volcanic outcrops (Reveal and Constance, 1972). Parish's phacelia could occur on Delamar Lake, but the detection of this species would only occur after a period of heavy rainfall that resulted in inundation of the Delamar Playa and germination of existing plants, if present. Currently, it is unknown whether this or Beatley's phacelia is present, and it is speculative to assume that the Avenger and Sentinel units would use the Delamar Lake during the ADA activities. If Parish's or Beatley's phacelia are present and the area is used, impacts to this species could be significant; however, it is unlikely that the proposed ADA activities would impact substantial populations of this species. Also, the activity area is periodically grazed by cattle and wildlife. Therefore, impacts to sensitive plant species that could occur in the proposed ADA activity area may be adverse but would be considered less than significant.

Wildlife

The USFWS, BLM, and NDOW identified six sensitive wildlife species with the potential to occur at one or more of the proposed ADA sites. These include the Federally threatened desert tortoise and five species of special concern, including chuckwalla, banded Gila monster, burrowing owl, ferruginous hawk, and pygmy rabbit

Desert Tortoise. Desert tortoise is not expected to occur at any of the proposed Patriot sites or the LSA site. Although a portion of the proposed ADA activity area would be located at the extreme northern range of this species, desert tortoise is known to occur in the region surrounding the LSA and the Delamar Valley access road (Alamo Canyon Road). There is also a small potential for this species to occur west of Delamar Lake near the Hiko Range. Protocol level surveys for desert tortoise conducted at the proposed LSA site and the LSA access road did not detect the presence of this species. However, this species was detected adjacent to Alamo Canyon Road. ADA site Patriot 1 is located in the general region, but does not occur in habitat that would support populations of this species (playa); Patriot site 1 is located approximately four miles outside of known habitat. No tortoise, suitable burrows, scat, or other desert tortoise signs were identified by a qualified tortoise biologist during surveys of the Patriot 1 site. However, this species may occur in surrounding or adjacent habitat along the Alamo Canyon Road. In order to avoid impacts to this species, mobile Avenger and Sentinel units would not leave existing roadways in areas identified as potential desert tortoise habitat. To further reduce impacts to desert tortoise, the following SOPs identified in the BA would be implemented:

- To the extent feasible, the U.S. Army will ensure that vehicle speeds will remain below 20 mph on dirt roads to minimize dust and desert tortoise impacts.
- The U.S. Army shall present a tortoise-education program to all personnel who may encounter desert tortoise during the exercise.
- Prior to conducting ADA activities, the U.S. Army will have the LSA site cleared by a qualified tortoise biologist.
- The U.S. Army will have a qualified tortoise biologist periodically inspect the sites (LSA and Alamo Canyon Access Road) during the ADA activities to ensure desert tortoise has not moved onto the site.
- If desert tortoise or signs of desert tortoise are observed, the observation shall be reported to the designated USFWS field contact representative.
- Activities that may endanger a tortoise will cease if a tortoise is found in harms way as a result of the exercise. ADA activities will resume after the authorized biologist removes the tortoise from danger, the activity will avoid the tortoise, or after the tortoise has moved to a safe area.
- Tortoises found in harms way shall be captured and relocated to undisturbed desert within 2 miles from the site found by an authorized desert tortoise biologist according to current approved protocol. Tortoises shall be deliberately moved solely for the purpose of moving them out of harms way.

By implementing these SOPs, impacts to desert tortoise would be minimized.

Chuckwalla. This species was not observed during the October and December surveys, but is known to occur in rocky areas throughout the region. Impacts to this species are not likely to occur as staging and emplacement of equipment and vehicles would avoid rocky outcrops and hillsides.

Banded Gila Monster. Although not identified in the proposed ADA activity area nor observed during the October or December surveys, this species has been reported to occur in the southern most section of the proposed ADA activity area. Potential habitat for this species was identified west of Delamar Lake. If present, this species could be affected by vehicle and equipment emplacement on some of the proposed ADA sites. Current restrictions on off-road vehicle travel (i.e., desert tortoise restrictions) limit access to existing dirt roadways for much of the southern portion of the proposed ADA activity

area. This area coincides with much of the habitat that could be occupied by banded Gila monster. Limited vehicle travel and the implementation of SOPs would reduce impacts to this species, if present, to less-than-significant levels.

Burrowing Owl. This species forages in open grasslands and scrub habitats that occur in the proposed ADA activity area. No burrowing owls were identified at or adjacent to any of the proposed ADA sites during the October and December surveys. As this species was not identified at any of the proposed ADA sites or the LSA, impacts to this species are not expected to occur.

Ferruginous Hawk. Although not observed during the October and December surveys, information provided by NDOW indicates that this species has been observed in Coal Valley. While none of the proposed ADA sites would be located in Coal Valley, vegetative foraging habitat, which includes grasslands, scrub communities, and sagebrush may be temporarily displaced by Avenger and Sentinel units. However, the relatively small amount of habitat displaced and the abundance of undeveloped foraging habitat in the area makes impacts to raptors less than significant. Although this species typically nests in rocky outcrops or stone pillars (NDOW, 2004c), this species has also been known to nest on the ground. On rare occasions, this species has nested in the vicinity of the northern portion of the proposed ADA activity area. Pre-emplacement surveys would avoid impacts to ground nesting birds, such as the ferruginous hawk.

Pygmy Rabbit. This species was not observed during the October and December surveys. However, information provided by NDOW indicates that this species could occur in the northern most section of the proposed ADA activity area. This species forages and utilizes Basin sagebrush communities and, if present, could be temporarily displaced from the ADA sites. However, no burrows for this species were observed, and measures incorporated into the proposed ADA activity description and the implementation of pre-emplacement surveys would minimize potential impacts to this species, if present. It should also be noted that no Basin sagebrush would be disturbed at the proposed ADA sites, and potential impacts from Avenger and Sentinel units would be minimal. Therefore, impacts to this species would be less than significant.

4.2.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed ADA activities would not be conducted. Potential impacts to biological resources would not occur.

4.2.4 Alternative B: Reduced Scope of ADA Activities

Implementation of Alternative B would reduce the total number of personnel and equipment participating in the proposed ADA activities. However, activities at each of the proposed ADA sites would be similar to the Proposed Action. Therefore, potential impacts to biological resources would be similar to the Proposed Action and would remain less than significant.

4.2.5 Alternative C: Elimination of Potential ADA Sites

Implementation of Alternative C would reduce the total number of ADA sites utilized by the proposed ADA activities. However, activities at each of the ADA sites would be similar to those identified under the Proposed Action. Alternative C could result in a reduction or elimination of potential impacts to specific species such as desert tortoise or banded Gila monster if ADA sites located in areas that support those species were eliminated. However, measures incorporated into the proposed ADA activity description and SOPs would already reduce impacts to these species to less-than-significant levels. Therefore, impacts to biological resources with implementation of Alternative C would remain less than significant.

4.3 WATER RESOURCES AND HYDROLOGY

4.3.1 Significance Criteria

An impact to water resources would be significant if it would (1) reduce water availability to or interfere with the supply of existing users, (2) create or contribute to overdraft of groundwater basins or exceed safe annual yield of water supply sources, (3) adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions, or (4) violate established laws or regulations that have been adopted to protect or manage water resources of an area. Flood hazard impacts would be considered significant if the proposed ADA activities were in an area with a high probability of flooding.

4.3.2 Proposed Action

Ground activities associated with the proposed ADA activities have the potential to affect surface and groundwater resources in the region. This includes temporary disturbance to soil and dirt roadways, and the on-site use and storage of fuel at each of the Patriot sites and the LSA site. Other potential impacts to water resources could occur from refueling vehicles or equipment, particularly mobile Avenger and Sentinel units and generators, and the use of solvents or cleaning agents during routine maintenance of equipment. No discharge of gray water from mobile kitchens or shower facilities would occur, although small amounts of wash water for personal hygiene could be discharged (43 CFR 8365.1-1).

As described in Section 3.3.1, all of the proposed ADA sites are located along the valley floors or playas that exist throughout the region. Many of these areas contain small ephemeral drainages, dry washes, or gullies that could support temporary flows during periods of rainfall. However, for most of the year these areas contain no water. In addition, the proposed ADA activities would be conducted toward the end of the wet season (see Table 3.3-1 for precipitation statistics). Activities that occur during periods of rainfall could potentially transport minor fuel leaks and spills into adjacent surface waters, including ephemeral streams and dry lakes. This could pose a potential significant impact to surface waters. However, most of the drainages at the proposed ADA sites are ephemeral in nature and are expected to have little to no surface flow at the time of the proposed ADA activities. In addition, SOPs would be applied, which include avoiding ADA sites if ponded or flowing water is present and

placing drip pans under all parked vehicles to reduce impacts to surface water. Therefore, impacts to surface waters from fuel leaks and spills would be considered less than significant. In addition, gray water from mobile kitchens and shower facilities would not be discharged into surface water bodies (including ephemeral streams, lakes and springs). Consequently, less-than-significant impacts to surface waters would occur from the proposed ADA activities.

A significant impact to ground water is not expected to occur as a result of the proposed ADA activities. As described in Section 3.4.2, the rock underlying much of the area of the region consists of permeable Cenozoic basin-fill and carbonate rock. These geologic features are characterized by solution cavities or fractures that can transport pollutants quickly through the rock layers into an aquifer. Many of the soils in the area are permeable, so liquids from the surface would move quickly through the soil and into the underlying rocks, increasing the potential of groundwater contamination. Implementation of SOPs, such as having personnel remain at least a quarter mile from riparian water sources, avoiding ADA sites if ponded or flowing water is present, and not disposing of gray water, would avoid the contamination of ground water resources.

4.3.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed ADA activities would not be conducted. Potential impacts to water resources would not occur.

4.3.4 Alternative B: Reduced Scope of ADA Activities

Implementation of Alternative B would reduce the total number of personnel and equipment participating in the proposed ADA activities. However, activities at each of the proposed ADA sites would be similar to the Proposed Action. Therefore, potential impacts to water resources would be similar to the Proposed Action and would remain less than significant.

4.3.5 Alternative C: Elimination of Potential ADA Sites

Implementation of Alternative C would reduce the total number of ADA sites utilized by the proposed ADA activities. However, activities at each of the ADA sites would be similar to the Proposed Action. Alternative C could result in a reduction or elimination of potential impacts to specific areas such as dry playas. However, implementation of SOPs would reduce impacts to water resources to less-than-significant levels.

4.4 EARTH RESOURCES (GEOLOGY)

4.4.1 Significance Criteria

Protection of unique geologic features and minimization of soil erosion are considered when evaluating impacts of the proposed ADA activities on geological resources, as well as limitations due to potential geologic hazards. The proposed ADA activities would be considered significant if they were located on a geologic unit or soil that is unstable, or that would become unstable as a result of the activities, and potentially result in a landslide, lateral spreading, subsidence, liquefaction, or collapse.

4.4.2 Proposed Action

Implementation of the proposed ADA activities could result in temporary impacts to soil surfaces from the emplacement of vehicles and equipment at the proposed ADA sites. Many soils in the region are susceptible to wind and/or water erosion and are not resilient to repeated disturbance. In some arid regions, soils are covered by a thin microphytic crust consisting of a thin layer of mosses, lichens, and other non-flowering vegetation that can be impacted by mechanical disturbance. Erosion potential is also generally more severe on sites containing steep, sparsely vegetated slopes, fine sandy or silty soils, and in loose soils where high winds occur. Loss or severe degradation of vegetative cover could also increase the erosion potential at a given location.

ADA activities have the potential to increase soil erosion to a limited degree at the ADA sites. To minimize erosion potential, most of the proposed sites were selected in locations such as flat or gently sloping areas containing populations of disturbed vegetation or compacted soils. As the proposed ADA activities would not result in the removal of any vegetation (see Section 2.3, SOPs), impacts to soils in these areas would be considered less than significant.

4.4.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed ADA activities would not be conducted. Potential impacts to earth resources would not occur.

4.4.4 Alternative B: Reduced Scope of ADA Activities

Implementation of Alternative B would reduce the total number of personnel and equipment participating in the proposed ADA activities. However, activities at each of the proposed ADA sites would be similar to the Proposed Action. Therefore, potential impacts to earth resources would be similar to the Proposed Action and would remain less than significant.

4.4.5 Alternative C: Elimination of Potential ADA Sites

Implementation of Alternative C would reduce the total number of ADA sites utilized by the proposed ADA activities. However, activities at each of the ADA sites would be similar to the Proposed Action. However, implementation of SOPs would reduce impacts to earth resources to less-than-significant levels.

4.5 LAND USE

4.5.1 Significance Criteria

Significance of potential land use impacts is based on the level of land use sensitivity in areas affected by the proposed ADA activities. In general, land use impacts could be significant if they would (1) be inconsistent or in noncompliance with applicable land use plans or policies, (2) preclude the viability of existing land use, (3) preclude continued use or occupation of an area, or (4) be incompatible with land uses adjacent to or in the vicinity of the Proposed Action to the extent that public health or safety is threatened.

4.5.2 Proposed Action

The ground-based portion of the proposed ADA activities would be conducted at one LSA site, one CCC, two Patriot sites (at any give time), and several mobile sites located within 50 meters (164 feet) of existing roads located throughout Lincoln County on land under the jurisdiction of the BLM. However, due to the nature of the proposed activities, land uses outside of the proposed sites would potentially be affected. The following discussion identifies potential effects of the proposed military activities on existing land uses in the vicinity of the proposed activity area.

Temporary fencing consisting of exclusion tape or snow fencing would be erected around the LSA and each Patriot site immediately prior to use, and would be removed immediately following the ADA activities. This temporary fencing would limit access to the sites, and would protect the public and wildlife during the two week period. Furthermore, the proposed ADA activities are short-term in nature and would impact a relatively small acreage compared to the geographic region. As the proposed ADA activities would avoid areas used frequently by the public, restricted access to the LSA, CCC, and ADA sites would not result in significant impacts to identified land uses.

With the exception of the LSA and the Patriot 3/CCC site, the proposed ADA sites would be located in remote areas, on land that is designated for livestock grazing and recreational activities. As the proposed ADA activities would temporarily result in military activities occurring in conjunction with other land uses, the U.S. Army would require a temporary land use permit from the BLM. At this time there is currently an agreement between the two agencies to issue this permit. However, potential impacts to BLM rangeland could include damage to and the temporary loss of grazing land or the temporary preclusion of ranching activities. In order to avoid impacts to sensitive grazing areas, the U.S. Army and the BLM specifically selected ADA sites that would minimize impacts to grazing. This includes sites that contain little if any vegetation or are dominated by invasive non-native species including Russian thistle and brome grasses. To reduce any potential impacts to grazing lands, SOPs would be implemented, such as the notification of permittees who are scheduled to graze in the vicinity of the proposed ADA sites during the proposed ADA activities, and the restoration of any site found to have experienced environmental damage within one year of the post-exercise inspection.

As stated above, the proposed ADA sites were selected to minimize potential agricultural land use impacts. Grazing facilities such as corrals and stock tanks, and other restricted areas, were avoided during the site selection process unless approved by BLM. The proposed ADA activities would not preclude access to active water troughs (see Section 3.5.1), and military vehicles would avoid cattle by maintaining speeds below 20 mph, where feasible (see Section 2.3). Due to the temporary nature of the proposed ADA activities and the incorporation of the grazing and restoration SOPs, impacts to grazing would be temporarily adverse but less than significant.

During the proposed ADA activities, Avenger and Sentinel units could potentially stop near the various communities, including Alamo and Crystal Springs. However, mobile Avenger and Sentinel units would remain for a limited time period (no more than four hours), would not disturb existing facilities, and would not result in a substantial change to the existing environmental setting. As these activities are

consistent with land use objectives identified for the area, and would be of short duration, impacts to land uses would be considered less than significant.

The LSA would be situated approximately one mile west of the community of Alamo, at the Alamo airfield. Sensitive receptors that may be affected by the proposed ADA activities would include the Pahranagat Valley Senior Citizens Center located on Airport Road, the Pahranagat Valley Middle School located on 1st Street South, and residences located along Broadway, as well as the aforementioned roads. Potential impacts to these sensitive receptors could occur from noise or traffic generated during the proposed ADA activities. However, the Pahranagat Valley Middle School would not be in session during the week of 21 March through 29 March, which is the period of peak ADA activities. The operating hours for the Pahranagat Valley Senior Citizens Center are currently 10 a.m. to 12 p.m., Monday through Sunday (Alamo Town Board, 2005), during which no impacts to the Senior Citizens Center are anticipated. In addition, access to the LSA would avoid the use of 1st Street South, thereby reducing impacts to the Pahranagat Middle School when in session. In order to further reduce potential impacts to the residents of Alamo, the U.S. Army would post announcement notices of the proposed ADA activities at several locations within the community of Alamo including the Post Office, Alamo Annex, the Sheriff's Office, and the local grocery store/gas station. With the incorporation of these elements into the proposed activities, potential impacts to nearby receptors would be reduced to a less-than-significant level.

The proposed ADA sites and the LSA are all located within 50 meters (164 feet) of an accessible road; consequently, potential impacts to land uses through the creation of new roadways would not occur. In addition, the proposed ADA activities would not block access to existing roadways or substantial areas of rangeland. By providing advance notice to the community of Alamo, potential impacts to land uses within the vicinity of the proposed ADA activities would remain less than significant.

4.5.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed ADA activities would not be conducted. There would be no impact to existing land uses.

4.5.4 Alternative B: Reduced Scope of ADA Activities

Under Alternative B, the number of personnel participating in the ADA activities would be less than under the Proposed Action. However, impacts associated with each of the proposed LSA and ADA sites would be similar to the Proposed Action. Furthermore, as part of the ADA site selection process for the Proposed Action, sensitive areas were eliminated from the list of proposed LSA and ADA sites. Therefore, a reduction in the number of sites would not serve to reduce potential impacts to surrounding land uses. Impacts from Alternative B would be similar to the impacts identified for the Proposed Action.

4.5.5 Alternative C: Elimination of Potential ADA Sites

Under Alternative C, the number of proposed ADA sites would be less than under the Proposed Action. As discussed for Alternative B, sensitive areas have been eliminated from the list of proposed LSA and

ADA sites, and a reduction in the number of sites would not serve to reduce the potential impacts to surrounding land uses. Impacts from Alternative C would be similar to impacts identified for the Proposed Action.

4.6 AESTHETICS

4.6.1 Significance Criteria

Determination of the significance of impacts to visual resources is based on the level of visual sensitivity in an area. Visual sensitivity is defined as the degree of public interest in a visual resource and concern over adverse changes in the quality of that resource. In general, an impact to a visual resource is significant if implementation of the proposed ADA activities would result in a substantial alteration to an existing sensitive visual character or setting.

4.6.2 Proposed Action

While the proposed ADA activities would generally be located in rural settings away from populated areas, the LSA would be emplaced approximately one mile west of the community of Alamo at the Alamo airfield. Access to the Alamo airfield, which is located on private lands, would be visible to resident populations during the proposed ADA activities. Avenger and Sentinel units could also be located in close proximity to the major travel corridors in the region or near the various communities in the ADA activity area, such as Alamo and Crystal Springs. The visual impact on motorists traveling these corridors would be greatest when the Avenger and Sentinel units are located in the foreground viewing-distance zone.

Although some of the proposed ADA sites may be visible to the public, they are located on BLM land that is classified as VRM IV. Under the Class IV management guidelines, substantial modifications to the viewscape can occur and activities may dominate the view and be the major focus of viewer attention. However, every attempt would be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic design or structural element.

The proposed ADA activities would not permanently alter the veiwscape, would be of short duration, and would occur in primarily rural areas; therefore, no permanent impacts to visual resources would occur. In addition, by the nature of the ADA equipment (camouflage paint and netting) many of the sites would likely blend into the background and would not result in substantial alteration to the viewscape. Furthermore, the proposed ADA activity area is located near an active military base (NAFB); military equipment is a common occurrence on the local highways, aircraft periodically utilize the Alamo dirt airfield, and many viewers travel to the area in order to view military equipment and aerial training exercises.

Implementation of the proposed ADA activities would be consistent with established BLM VRM Class IV management objectives and would not result in significant impacts to visual resources in the proposed ADA activity area.

4.6.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed ADA activities would not be conducted. There would be no impact to visual resources.

4.6.4 Alternative B: Reduced Scope of ADA Activities

Under Alternative B, the number of personnel participating in the ADA activities would be less than under the Proposed Action. However, equipment use and placement in the viewscape associated with the LSA and each of the proposed ADA sites would be similar to the Proposed Action. As the proposed ADA activities would not result in impacts to visual resources, impacts to aesthetics under Alternative B would not occur.

4.6.5 Alternative C: Elimination of Potential ADA Sites

Under Alternative C, the number of proposed ADA sites would be less than under the Proposed Action. As discussed for Alternative B, equipment use and placement in the viewscape associated with each of the proposed LSA and ADA sites would be similar to the Proposed Action. As the proposed ADA activities would not result in impacts to visual resources, impacts under Alternative C would not occur.

4.7 RECREATION

4.7.1 Significance Criteria

Recreation impacts would be considered significant if they would result in permanent or long-term preclusion of a recreational area, temporarily preclude use of an area during a peak recreational season, result in long-term loss or degradation of the recreational value of a major recreational facility, or conflict with an established use of an area.

The proposed ADA activities would be located in the vicinity of several recreational facilities, which are described in Section 3.7. While the proposed ADA activities would not be located on these facilities, military activities could potentially result in temporary impacts to recreational opportunities occurring in the region. The following discussion identifies the potential effects of the proposed military activities on existing recreational activities.

4.7.2 Proposed Action

The proposed ADA sites are located on BLM land that is used for a number of recreational activities including hunting, off-road vehicle use, mountain biking, and hiking. The proposed ADA activities would not restrict access to recreational facilities and would have no impact on the use of these facilities. Activities associated with the proposed activity could result in a short-term disruption to recreation users seeking access to remote and rarely utilized scenic areas; however, the proposed ADA ground activities would be of limited duration and would not limit access to the region. Subsequently, impacts to recreational users may be temporarily adverse but less then significant. In addition, as military activities, especially aerial overflights, often attract visitors, the proposed ADA activities could

potentially create beneficial impacts for military enthusiasts specifically seeking recreational opportunities such as observing military aircraft and equipment.

The Yucca Chuckers M/C race that is scheduled to occur in March would not be affected by the proposed ADA activities. The proposed activity would not preclude the use of access roads within the county, and consequently would not adversely affect the off-highway motorbike race. The U.S. Army has been notified of the schedule and location for the race (BLM, 2005f), and will coordinate its military activities accordingly. No impacts to the Yucca Chuckers M/C race activities would occur.

Impacts to other recreational activities such as hunting could occur as a result of the proposed ADA activities. However, since the proposed ADA activities are scheduled for late March and early April, which is outside the hunting season for all major big game animals, the potential impacts to hunting would be less than significant. As the proposed ADA activities would not result in a permanent loss of access to BLM lands, which could affect this recreational opportunity, potential impacts to hunting would be less than significant.

4.7.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed ADA activities would not be conducted. There would be no impact to recreational facilities.

4.7.4 Alternative B: Reduced Scope of ADA Activities

Implementation of Alternative B would reduce the number of personnel participating in the proposed ADA activities. Utilizing fewer personnel would not result in substantial changes to potential impacts compared to the Proposed Action. Impacts from Alternative B would be similar to those impacts identified for the Proposed Action.

4.7.5 Alternative C: Elimination of Potential ADA Sites

Under Alternative C, the number of proposed ADA sites would be reduced. Since the proposed ADA activities would not result in significant impacts to recreational activities, a reduction in the number of sites would not result in a substantial change from the Proposed Action. Impacts from Alternative C would be similar to impacts under the Proposed Action, and would be less than significant.

4.8 NOISE

4.8.1 Significance Criteria

Noise impact analyses typically evaluate potential changes to existing noise environments that would be instigated by implementation of the proposed ADA activities. Potential changes could be beneficial if they would reduce the number of sensitive receptors exposed to unacceptable noise levels; conversely, changes could be adverse if they result in increased exposure to unacceptable noise levels. The proposed ADA activities would be considered significant if they would result in a substantial temporary or periodic increase in ambient noise levels above noise levels existing without implementation of the

proposed ADA activities, in those areas of the proposed ADA activity area where sensitive receptors are located.

4.8.2 Proposed Action

The proposed ADA activities, and other action-alternatives, would introduce military exercise activities onto BLM lands surrounding NAFB. The increased ground activities on BLM lands would modify the acoustic characteristics of those areas used during the proposed ADA activities, potentially increasing noise exposure in those areas. However, it should be noted that aircraft operations occurring during the proposed ADA activities would remain the dominate noise source, and would result in noise levels of up to 85 Ldn (USAF, 1999b). Since aircraft operations are considered part of the environmental baseline or existing conditions, and would occur regardless of whether the proposed ADA activities (i.e., the ground component) occur, this section assesses anticipated noise from ground-related operations only.

The proposed ADA activities would have the potential to temporarily increase noise in the areas in which ground activities would occur. Noise sources include logistics-related operations required to bring troops and equipment to the various sites, noise which naturally results from increased human activity in concentrated areas, noise from equipment (e.g., generators), and noise resulting from deployment and other exercise-related activities in the field. Some disturbance to animals grazing nearby, and residences of the surrounding communities (Alamo and Crystal Springs), could occur as a result of increased noise levels. However, most of the noise associated with the proposed ADA activities is anticipated to be at relatively low levels, temporary (approximately two weeks in duration), and would generally occur in rural, unpopulated areas where there are little to no sensitive noise receptors. It should be noted that travel through the community of Alamo would be limited to daylight hours only, to the extent possible. Additionally, other than the LSA, none of the other proposed ADA Patriot sites would be located in or near the noise sensitive areas identified in Figure 3.8-1. Avenger and Sentinel units would also avoid, to the extent feasible, the noise sensitive areas identified in Figure 3.8-1 per the environmental criteria listed in Section 2.2.1.

To reduce noise impacts associated with the use of the LSA, the ADA and logistics units would access the LSA via Broadway/1st Street West/Airport Road. 1st Street South would not be used to access the LSA to minimize potential noise impacts to Pahranagat Middle School. Additionally, the U.S. Army would post announcement notices at various locations in Pahranagat Valley, including the Post Office, Alamo Annex, the Sheriff's Office, and the local grocery store/gas station. The announcement would state specifically when the proposed ADA activities will occur and would provide contact information for questions or comments. The U.S. Army would serve as the contact in the event that noise levels from ground-based operations during the ADA activities become disruptive to residents. In the event of complaints by nearby residents, the environmental monitoring teams would assess noise impacts and implement feasible measures to reduce noise levels, such as relocating tents, kitchen, shower/bathing facilities, or equipment as necessary. With implementation of these components of the proposed ADA activities, if required, noise impacts associated with the proposed ADA activities would be less than significant.

4.8.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed ADA activities would not be conducted. Noise levels would remain as described in Section 3.8.1. No noise impacts due to ground operations would occur.

4.8.4 Alternative B: Reduced Scope of ADA Activities

Under this alternative, the total potential number of personnel participating would be less than the proposed ADA activities. However, the noise levels at each individual ADA site for Alternative B would remain relatively unchanged. The types of activities performed would be similar to the Proposed Action. Therefore, noise impacts would be similar to the Proposed Action and would remain less than significant.

4.8.5 Alternative C: Elimination of Potential ADA Sites

Under this alternative, not all of the proposed ADA sites would be utilized. As was discussed for Alternative B, the noise levels at each individual ADA site used under Alternative C would remain relatively unchanged and the types of exercise activities performed would be similar to the Proposed Action. Therefore, noise impacts would remain less than significant.

4.9 SOCIOECONOMICS

4.9.1 Significance Criteria

The significance of population and expenditure impacts are assessed in terms of their direct effect on the local economy and related effect on other socioeconomic resources (e.g., housing). The magnitude of potential impacts can vary greatly depending on the location of the Proposed Action. If implementation of a Proposed Action would result in substantial shifts in population trends, adversely affect regional spending and earning patterns, or introduce overwhelming demand for public services or utilities, socioeconomic impacts would be considered significant.

Impacts regarding environmental justice are evaluated by considering how potential impacts resulting from implementation of the proposed ADA activities could affect nearby populations. Characteristics of potentially affected populations are evaluated to determine whether minority or low-income communities would be disproportionately affected components of a specific action. A significant impact with regard to environmental justice would occur if a disproportionate number of minority or low income communities were adversely affected by implementation of the proposed ADA activities.

Potential socioeconomic impacts resulting from the proposed ADA activities could affect the unincorporated communities of Lincoln County. The following discussion identifies the potential socioeconomic effects of the proposed military activities on the communities within the vicinity of the proposed ADA activities.

4.9.2 Proposed Action

The proposed ADA activities would primarily occur in Lincoln County, which is the least urbanized and has the greatest unemployment rate of the southeastern counties (see Section 3.9). However, the

proposed ADA activities are short-term, and would only involve military personnel in preparing and conducting the activities. Implementation of the proposed ADA activities would neither place a demand on employment opportunities, housing, or public facilities, nor would it create new employment opportunities, housing, or public facilities in the region. Consequently, the proposed ADA activities would not create socioeconomic impacts within the adjacent communities and no impacts would occur.

Since the proposed ADA activities would be conducted under Nellis airspace, north of the Moapa River Indian Reservation, they would not impact tribal lands.

4.9.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed ADA activities would not be conducted. Socioeconomic impacts to communities in the region would not occur.

4.9.4 Alternative B: Reduced Scope of ADA Activities

Implementation of Alternative B would reduce the number of personnel participating in the Proposed Action. However, military activities conducted at each of the proposed ADA sites would be similar to those conducted under the Proposed Action. Impacts from Alternative B would be similar to the Proposed Action and would not be anticipated to occur.

4.9.5 Alternative C: Elimination of Potential ADA Sites

Implementation of Alternative C would reduce the total number of proposed ADA sites utilized during the proposed ADA activities. Reducing the number of sites under Alternative C would not alter the socioeconomic impacts to the communities in the vicinity of the proposed ADA activities. Socioeconomic impacts from Alternative C would be similar the Proposed Action and would not be anticipated to occur.

4.10 TRANSPORTATION

4.10.1 Significance Criteria

Impacts to transportation and circulation are assessed with respect to the potential for disruption or improvement of current transportation patterns and systems, deterioration or improvement to existing levels of service, and changes in existing levels of transportation safety during construction or operation of a project. Impacts may arise from physical changes to circulation (e.g., closing, rerouting, or establishing roads), military activity and introduction of military-related traffic on local roads, or changes in daily or peak hour traffic volumes created by either direct or indirect workforce and population changes relative to surrounding activities. The proposed ADA activities would have a significant impact on transportation if they were to cause closures of major roadways, restrict access to or from adjacent land uses, or restrict the movements of emergency vehicles.

4.10.2 Proposed Action

The proposed ADA activities, and other action-alternatives, would introduce military exercise activities into BLM lands surrounding NAFB. The increased ground activities on BLM lands could potentially

increase traffic in those areas. This section assesses anticipated traffic impacts from ground-related exercise operations. Traffic would temporarily increase during deployment, operations, and demobilization phases of the proposed ADA activities. Potential issues include additional congestion on local roadways, and delays for highway travelers caused by a slow moving convoy.

During initial deployment of equipment and personnel, a single convoy would begin at NAFB in North Las Vegas and head to the proposed exercise area in Lincoln County. Traffic volumes would increase on the local roadways between NAFB and U.S. Highway 93. Approximately 200 vehicles (maximum), consisting of HMMWVs, mid-sized trucks, heavy trucks, and towed radar units would travel from NAFB to the proposed ADA activity area in Lincoln County. It is anticipated that the convoy would travel north along Nellis Boulevard, then northeast on Las Vegas Boulevard to U.S. Highway 93. As shown in Table 3.10-1, traffic volumes on Nellis Boulevard (Station 680) would increase less than one percent, and on Las Vegas Boulevard (Station 201) traffic volumes would increase approximately five percent. Therefore, the increase on the roadways between NAFB and U.S. Highway 93 would be minimal. However, increased traffic leaving NAFB could have the potential to disrupt traffic on Nellis Boulevard, Las Vegas Boulevard and on U.S. Highway 93 as the convoy leaves Clark County. Impacts would be reduced by scheduling the convoy to avoid traveling in urban areas (i.e., North Las Vegas) during peak traffic hours.

With respect to the major highways, traffic along U.S. Highway 93 in Lincoln County, prior to reaching Alamo, would experience the greatest increase in highway traffic compared to existing highway traffic volumes as a result of the proposed ADA activities. Traffic volumes on U.S. Highway 93 (Station 1) would increase approximately 11 percent, which would have only a minor impact on the existing good level of service on this highway. Just south of Alamo, the convoy would begin to disperse to the various field sites generally using rural, unpaved (dirt) roads, such as Alamo Canyon Road. Traffic on these roads is generally very limited. It should be noted that Avenger and Sentinel units could move from site to site or stop on any barren road pullout along the various dirt roads of the back country. Avenger and Sentinel units would likely move approximately three times during the ADA activity period.

Implementation of the proposed ADA activities would not require the closure of any roadways, would not substantially disrupt current transportation patterns and systems, would not degrade existing levels of service, would not limit access to or from adjacent land uses, and would not restrict emergency vehicle access. Therefore, implementation of the proposed ADA activities would result in less than significant impacts to traffic and transportation resources.

4.10.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed ADA activities would not be conducted. Therefore no impact to transportation would occur under the No Action Alternative.

4.10.4 Alternative B: Reduced Scope of ADA Activities

Although the scope of the ADA activities would be less under this alternative, the types of activities would be similar. The reduced scope of the proposed ADA activities would result in proportionately

reduced traffic. Therefore, the traffic impacts addressed in Section 4.10.1 would generally remain as described, although reduced proportionately. As such, traffic impacts would remain less than significant.

4.10.5 Alternative C: Elimination of Potential ADA Sites

Under this alternative, not all of the ADA sites would be utilized. However, traffic impacts to the roadways between NAFB and Alamo would generally remain similar to or potentially less than those associated with the proposed ADA activities. Impacts to back country roads would be potentially reduced, as fewer sites would be accessed. Traffic impacts would remain less than significant.

4.11 HAZARDOUS MATERIALS AND WASTE HANDLING AND DISPOSAL

4.11.1 Significance Criteria

This section discusses potential safety effects of the proposed ADA activities and alternatives. Impacts are assessed according to the potential for increased safety risks to ground personnel, the public, and property. Given the nature of the action, the primary goal of the safety analysis is to assess risks to public safety associated with incompatible land uses, namely the placement of ADA sites or military equipment in relation to potential health and safety hazards in the vicinity of the region (i.e., local communities such as Alamo, Hiko, or Crystal Springs). Impacts to public safety would be significant if implementation of the proposed ADA activities substantially increased risks to the public or the environment, or if the proposed ADA activities resulted in incompatible land use with regard to established safety criteria.

4.11.2 Proposed Action

Fire Risk and Management/Ground Safety

The proposed ADA activities would result in small concentrations of personnel and equipment at various sites located on BLM land for a brief period of time (approximately two weeks). All ground-operations to be performed during the proposed ADA activities are currently performed in day-to-day training. The proposed ADA activities would include implementing existing processes and procedures that ensure safety during ongoing operations and would continue to ensure safety during the proposed ADA activities. For example, all vehicles deployed to field sites are furnished with spark arresters on their mufflers to reduce fire risk. Additionally, local fire departments would be alerted by the U.S. Army prior to field deployment. Furthermore, the following SOPs would help minimize ground safety and fire risk:

- The chain of command (i.e., U.S. Army) is responsible for each Avenger, Patriot, and Sentinel unit to ensure safety and environmental requirements/restrictions are being observed. The chain of command will approve each relocation by Avenger and Sentinel units, document any environmental violation, and report violations to BLM upon completion of the ADA activities.
- U.S. Army ground-based units will use GPS to ensure they are located within proposed site boundaries. Proposed Patriot bivouac areas will be clearly delineated on maps.

Implementation of existing processes and procedures, as well as the above SOPs, would ensure less-than-significant safety and fire impacts.

Radio Frequency Emissions

As discussed in Section 3.11.1, radars would be located throughout the proposed ADA activity area. Acceptable energy levels and safe separation distances for persons vary depending on the frequency and transmitted power of the RF emitter. For the emitters used on the NTTR, calculations have been performed to determine the required separation distances for persons. These data are presented in Table 4.11-1. When a system operates across a band of frequencies, the range of separation distances is shown.

Table 4.11-1 Emitter Safe-Separation Distances

Equipment	Distance, Meters (in Feet)	Equipment	Distance, Meters (in Feet)
AN/MPQ-T3	19 – 24 (62 – 78)	AN/TPT-4	16 – 18 (53 – 58)
AN/MPS-14	239 (783)	AN/TPT-T1V,1A	36 (118)
AN/MPS-T19	132 (432)	AN/TPT-T1V,1B	40 (131)
AN/MSQ-T13	39 – 73 (127 – 239)	AN/TPT-T1V,2A	45 (146)
AN/MSQ-T43	54 – 59 (176 – 194)	AN/TPT-T1V,2B	17 (57)
AN/MPS-T1	0.6 – 77 (2 – 252)	AN/MSQ-77	28 (93)
AN/VPQ-1	6.4 (21)		

Source: USAF, 1999a

The majority of this equipment is aircraft threat simulation radar. Frequency management ensures that these transmitters do not create interference with other Federal or civil transmitters or receivers. The unit is normally placed on elevated ground, and then emits skyward. It is not pointed at the ground or along roadways. This equipment is operated under strict safety control measures that are determined for each system. These measures include installing warning signs, erecting rope or chain barriers, and having the equipment and the surrounding area under constant observation while it is operating. Adherence to these established safety standards ensures that no health or safety impacts would occur. Additionally, RF emitters used on aircraft pose no hazard to the public due to the aircraft's altitude, the energy levels used by the equipment, and the speed of the aircraft. Given these factors, the duration of any possible RF energy exposure is very small if such exposure were even to occur.

Hazardous Materials and Solid Waste

The ADA sites identified for the proposed ADA activities would not be located in areas where hazardous materials have been identified (see Section 3.11.2.1). However, hazardous materials would be used during the proposed ADA activities to operate the Patriot, Avenger and Sentinel units, generators, mobile field kitchens, HMMWVs, portable toilets, etc. Fuel would also be stored on Patriot sites and at the LSA for the duration of the proposed ADA activities. Avenger and Sentinel units would be serviced by fuel truck up to four times during the proposed ADA activities. Copper grounding rods may also be used to ground electrical equipment. These rods, if used, would be removed at the conclusion of the proposed ADA activities, thereby avoiding hazards to vehicle tires, people, and animals, as well as reducing the potential of introducing copper into the environment.

The relatively small quantity of hazardous materials involved in the proposed ADA activities would not be expected to pose a significant public health and safety hazard through release of emissions or risk of upset. However, safety risks associated with the use of hazardous materials would exist. These safety risks would be reduced through established hazardous materials and waste management and spill prevention, control, and countermeasure procedures employed at participating military installations to preclude adverse impacts. Additionally, the use of a HAZMART would help to identify the least hazardous product appropriate for the task, provide for proper labeling of materials, and provide instructions on handling of hazardous materials. Safety risks would be further reduced to less-than-significant levels with implementation of the following SOPs:

- The chain of command (i.e., U.S. Army) is responsible for each Avenger, Patriot, and Sentinel unit to ensure safety and environmental requirements/restrictions are being observed. The chain of command will approve each relocation by Avenger and Sentinel units, document any environmental violation, and coordinate with the U.S. Army and the BLM if reclamation is required upon completion of the ADA activities.
- The U.S. Army will not dig at field sites (To minimize the potential for disturbance of unknown hazardous materials.).
- The U.S. Army will police trash and debris at all sites daily, and store waste in sealed containers.
- Sites found to have experienced environmental damage requiring restoration will be restored by the U.S. Army as soon as practicable after the ADA activities are completed. Restoration methods, if required, will be determined in consultation between the U.S. Army and the BLM.
- The U.S. Army will place drip pans under parked vehicles to avoid contaminating soils.
- The U.S. Army will prepare spill prevention and response plans for all field sites, and locate emergency response equipment at Patriot sites and the LSA. Soils contaminated by spills or cleaning wastes will be contained and removed by the U.S. Army to an approved disposal site. Disposal of hazardous wastes will be in compliance with applicable laws and regulations.
- The U.S. Army will make Material Safety Data Sheets readily available to all personnel at the various sites.

4.11.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed ADA activities would not be conducted. No new safety issues would exist, and there would be no hazardous materials requirements.

4.11.4 Alternative B: Reduced Scope of ADA Activities

Although the scope of the ADA activities would be less under this alternative, the types of activities would be similar to the Proposed Action. The reduced scope of the proposed ADA activities would result in proportionately reduced exposure to safety and hazardous material risks. Therefore, the safety and hazardous materials issues addressed in Section 4.11.1 above would generally remain as described, although reduced proportionately. As such, safety and hazardous materials impacts would remain less than significant.

4.11.5 Alternative C: Elimination of Potential ADA Sites

Under this alternative, not all of the ADA sites would be utilized. However, safety issues at each individual site would remain unchanged and the types of exercise activities performed would be similar

to the proposed ADA activities. Alternatively, the potential area of impact for hazardous material risks would be reduced. Overall, safety and hazardous material impacts would remain less than significant with the implementation of the SOPs described in Section 4.11.2 above.

4.12 CULTURAL RESOURCES

4.12.1 Significance Criteria

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may occur by physically altering, damaging, or destroying all or part of a resource; altering the characteristics of the surrounding environment that contribute to resource significance (defined below); introducing visual, audible, or atmospheric elements that are out of character with the property or alter its setting; or neglecting the resource to the extent that it is deteriorated or destroyed. Identifying the exact location of cultural resources that could be affected by the proposed ADA activities determines the significance of direct and indirect impacts. Indirect impacts can occur on resources within the area of the proposed ADA activities independent of specific exercise activities. Such secondary effects can include changing erosion patterns that may degrade sites, increased off-road or other vehicle traffic, and increased public/military access or usage of the site area. Significant cultural resources are resources that:

- Are associated with events that have made a significant contribution to the broad patterns of our history; or
- Are associated with the lives of persons significant in our past; or
- Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Have yielded, or are likely to yield, information important in prehistory (36 CFR 60.6).

4.12.2 Proposed Action

The types of ground activities associated with the proposed ADA activities have the potential to impact cultural resources. To counter possible impacts, known cultural resources in the activity area have been located and marked on the ground. Intensive field inventories (Class III), would be conducted as appropriate, prior to implementation of the proposed ADA activities. If cultural or paleontological sites are found, the proposed ADA activities would avoid all known cultural resources. The proposed ADA activities would be short-term and all equipment would be removed post exercise; hence, there would be no impacts to the visual or atmospheric character of the area. Analysis of noise impacts associated with the proposed ADA activities indicates that noise impacts would be less than significant, and consequently, would have no impact on cultural resources. Additionally, only rubber tired vehicles would be utilized in the area for a short period of time (see Section 2.3, SOPs), so potential buried sites would not be significantly affected. Furthermore, vehicle speeds would be restricted to 20 miles per hour, and the proposed ADA activities would not entail excavation of any kind (see Section 2.3, SOPs). Therefore impacts from the proposed ADA activities can be considered less than significant and would have no adverse effect on cultural resources.

4.12.3 Alternative A: No Action Alternative

Under the no action alternative, the proposed ADA activities would not be conducted. Therefore, impacts to cultural resources would not occur as a result of these activities.

4.12.4 Alternative B: Reduced Scope of Exercise

Although the scope of the proposed ADA activities would be reduced under this alternative, the types of activities would be similar to the Proposed Action. Therefore, no significant impacts to cultural resources would occur.

4.12.5 Alternative C: Elimination of Potential ADA Sites

Under this alternative, not all of the ADA sites would be utilized, but activities would be the same as those associated with the Proposed Action. Therefore, no significant impacts to cultural resources would occur.

4.13 UTILITIES

4.13.1 Significance Criteria

Impacts to utilities would be considered significant if existing utility systems would be adversely affected by the proposed ADA activities. Any unplanned disruption of utility service or physical impact to existing utility lines would also be considered significant.

4.13.2 Proposed Action

As discussed in Section 3.13.1, ADA site Patriot 1 would be located near an existing utility corridor. Underground FOC lines would not be disrupted by the proposed ADA activities, as no digging would occur at any of the sites (see Section 2.3, SOPs). Overhead utility lines could have the potential to interfere with ground-related exercise operations, in so far as equipment movement may be hindered. However, none of the equipment involved in the proposed ADA activities would exceed clearance requirements for maneuvering around and between overhead utility lines. It should also be noted that each Patriot site would be equipped with a generator, and Avenger and Sentinel units would obtain power from battery operated power supplies or directly from the vehicles (HMMWVs). No "tapping" into existing utilities would occur. Therefore, the proposed ADA activities would have no impact on utilities.

4.13.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed ADA activities would not be conducted. No impacts to utilities would occur.

4.13.4 Alternative B: Reduced Scope of ADA Activities

Although the scope of the ADA activities would be reduced under this alternative, the types of activities would be similar to the Proposed Action. No impacts to utilities would occur.

4.13.5 Alternative C: Elimination of Potential ADA Sites

Under this alternative, not all of the ADA sites would be utilized. As with the Proposed Action, no impacts to utilities would occur.

5. CUMULATIVE IMPACTS

5.1 INTRODUCTION

Cumulative impacts to environmental resources can result from the relationship of the proposed ADA activities to other past, present, and reasonably foreseeable future actions in the proposed ADA activity area. Cumulative impacts can result from minor, but collectively significant, actions undertaken over a period of time and by various agencies (Federal, state, or local) or private entities. In accordance with NEPA and CEQ regulations, a discussion of cumulative impacts resulting from actions and projects that are proposed, under implementation, or reasonably anticipated to be implemented in the near future is required.

Cumulative environmental impacts are most likely to arise when a relationship exists between a proposed activity and other projects expected to occur in a similar location, time period, and/or involving similar actions. Projects in proximity to the proposed ADA activities would be expected to have more potential for a relationship that could result in potential cumulative impacts than those more geographically separated.

Projects considered to have the potential for creating cumulative impacts in association with the proposed activity are identified in Table 5-1. In each instance, the assessment focuses on addressing two fundamental questions: (1) Does a relationship exist such that the impacts from the proposed ADA activities might affect or be affected by impacts from other actions?, and (2) If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the proposed activity is considered alone?

Table 5-1 Cumulative Projects in the Proposed ADA Activity Area

Project Name	General Location	Description
		LINCOLN COUNTY
Coyote Springs Housing Development	Located on the line between Lincoln and Clark Counties, close to the junction of U.S. Highway 93 and State Highway 168.	• 42,000-acre master planned community • Grading of golf course in Clark County will begin in March/April 2005. Construction of homes will commence approximately two years later. • Approximately 55 miles north of Las Vegas, near the junction of U.S. Highway 93 and State Highway 168, northeast of Moapa • ⅓ in Clark County and ⅔ in Lincoln County • The master plan has been approved by Clark County • Planned to include up to six golf courses, vacation villas, custom lots, multi-family housing and commercial and retail development
Lincoln Estates	Six miles west of Rachel, NV, at Gunderson Road and SR 375	• Residential subdivision • Included in the Lincoln County Master Plan • Consists of approximately 1000 lots, zoned for single-family housing
Yucca Mountain Railroad	Union Pacific rail line through Lincoln County and the City of Caliente	• The Federal government views the mainline Union Pacific rail line through Lincoln County and the City of Caliente as a likely corridor along which shipments of nuclear waste would move through Nevada • Congress includes this in legislation now pending (S.1271 and HR.1020)

Source: Dixon, Ken, 2004; Fine, Millie, 2004; Harris, Kelly, 2004; Bloch, 2004; Lincoln County, 2004c; and LVS, 2004.

5.2 ANALYSIS OF CUMULATIVE IMPACTS

5.2.1 Air Quality

As discussed in Table 5-1, there are other projects that would be in construction or operation near the remote ADA sites in Lincoln County. There are also other projects that would be in construction or operation in Clark County or near the primary travel route from NAFB to the Lincoln County ADA sites; however, the proposed ADA activity emissions at any one point during the transit from NAFB to the Lincoln County ADA sites are minimal and would not create a new significant cumulative air quality impact. Additionally, the proposed ADA activity emissions within NAFB and Clark County would constitute a very small amount of the annual emissions for NAFB or for the County, could be considered to be part of the normal baseline for NAFB ground based emissions, and would not have the potential to create significant cumulative air quality impacts.

The baseline NAFB complex emission summary for the Nellis area and the NTTR, which includes Lincoln County, is given in Table 5-2.

Table 5-2 Summary of Baseline NTTR Emissions (tons/year)

Location	NOx	CO	VOC	SOx	PM_{10}
NAFB (ground based)	339	1,805	228	34	34
NAFB (aircraft only)	320	839	305	338	30
NTTR (Aircraft Only)	8,983	695	52	214	230

Source: USAF, 1999.

The aircraft emissions that are associated with the proposed ADA activities are considered part of and consistent with normal operation within the NTTR. It can be seen that the proposed ADA activity emissions are negligible in comparison with the normal operating emissions at NAFB and within the NTTR, as they are in comparison with the total annual emissions of Clark County as a whole.

5.2.2 Biological Resources

The proposed ADA activities would not result in significant impacts to biological resources. Historic activities conducted in the region include a major electrical utility corridor, the Lincoln County fiber optics cable, and rangeland improvements such as repairs to fences, cattle guards, pipelines, troughs, and reservoirs (BLM, 2005h). Ongoing activities in the region would include continued cattle grazing and periodic maintenance of corrals, fences, and stock tanks. As the proposed ADA activities are short-term, any effects on biological resources would most likely be temporary, and would terminate upon completion of the exercise. In order to avoid permanent impacts to biological resources, the proposed ADA activities would include restoration of sites that have experienced environmental damage. The U.S. Army would also implement SOPs to avoid impacts to sensitive species, such as the desert tortoise (see Section 2.3). Since any impacts associated with the proposed ADA activities would be short-term and would not substantially affect environmental resources, the proposed ADA activities would not contribute cumulatively to projects occurring after the completion of the exercise.

The only project scheduled to occur during the proposed ADA activities is the Coyote Springs Housing Development located near the border of the Lincoln and Clark county lines. Although construction of

this housing development could result in a reduction in rangeland and impacts to sensitive species, the potential cumulative impacts of this project would likely not jeopardize sensitive resources in the region.

5.2.3 Water Resources and Hydrology

Implementation of the proposed ADA activities would not result in significant impacts to water resources. The nearest cumulative project is approximately 30 miles south of the proposed ADA sites (i.e., Coyote Springs Housing Development). As potential effects to water resources are localized and would not combine with any of the projects listed in Table 5-1, the proposed ADA activities would not contribute to a cumulative effect on water resources or hydrology in the region.

5.2.4 Earth Resources (Geology)

No significant impacts to geological resources would occur from implementation of the proposed ADA activities. The nearest cumulative project is approximately 30 miles south of the proposed ADA sites (i.e., Coyote Springs Housing Development). As potential effects to soils and geology would be site specific, the proposed ADA activities would not contribute to cumulative impacts in the region.

5.2.5 Land Use

The proposed ADA activities would not significantly impact existing land uses. As the proposed ADA activities are short-term, any effects on land use would be temporary and would terminate upon completion of the exercise. In order to avoid permanent impacts to land uses such as grazing, the proposed ADA activities would include restoration of sites that have experienced environmental damage. Sites that require extensive restoration would not be available to grazing for several years. Since impacts associated with land use would be short-term, the proposed ADA activities would not contribute cumulatively to projects that are scheduled to occur after completion of the exercise.

The Coyote Springs Housing Development may occur simultaneously with the proposed ADA activities (see Table 5-1). However, the Coyote Springs Housing Development project would be located approximately 30 miles south of the nearest ADA site, and any potential land use effects would be localized at the proposed ADA sites within Lincoln County. As such, the proposed ADA activities would not contribute to land use impacts that would be cumulatively considerable.

5.2.6 Aesthetics

The proposed ADA activities would be short term, localized, and would not significantly impact or conflict with BLM visual resource guidelines. The proposed ADA activities would not contribute to a degradation or alteration of the scenic viewscape, and any potential impacts would cease to occur upon completion of the proposed activity. As such, no cumulative aesthetics impacts would occur.

5.2.7 Recreation

The proposed ADA activities would not significantly impact existing recreational uses. While initial construction of the Coyote Springs Housing Development (grading of the golf course) would begin

during the same time period as the proposed ADA activities, the development project would be located approximately 30 miles south of the nearest ADA site. Consequently, the development project would not create additional impacts to potential recreation users seeking access to remote and rarely utilized scenic areas within the vicinity of the proposed ADA activities. The proposed ADA activities would not contribute to an incremental effect on recreation that would be cumulatively considerable.

5.2.8 Noise

The primary noise source within the ADA activity area is from aircraft overflight originating from NAFB. It should be noted that the air component associated with the proposed ADA activities is considered as part of the environmental baseline or existing conditions and therefore would not be cumulatively additive with the ground component of the proposed ADA activities. However, for those areas not regularly exposed to military training-related noise (i.e. ground operations), the exercise-related noise would clearly dominate the noise environment during the period of the proposed ADA activities. However, due to the short duration of the proposed ADA activities, minimal sensitive noise receptors, and the large distance from the projects listed in Table 5-1, significant cumulative noise impacts would not occur.

5.2.9 Socioeconomic

The proposed ADA activities would not create socioeconomic impacts to any adjacent communities in the region. As such, the proposed ADA activities would not contribute to an incremental socioeconomic effect that would be cumulatively considerable.

The proposed Coyote Springs Housing Development may create potential impacts to the Moapa Band of Paiute Indians, located approximately 12 miles southeast of the proposed development. However, the proposed ADA activities are of short duration and would avoid tribal lands. Even collectively, the socioeconomic impacts from cumulative projects would be small compared to the geographic region. Consequently, the proposed ADA activities would not create potential impacts to the Moapa Band of Paiute Indians that would be cumulatively considerable.

5.2.10 Transportation

Cumulative impacts to transportation could potentially result from implementation of the proposed ADA activities. Convoy traffic from NAFB to the proposed ADA activity area routed along U.S. Highway 93 in conjunction with the Coyote Springs Housing Development, which would include grading of a golf course in March/April of 2005, could result in increased volumes of traffic in the region. However, the quantity of traffic associated with grading the golf course and generated during the initial convoy from NAFB would be minimal, temporary, and would not contribute to permanent changes in traffic volume. Given the short duration of the proposed ADA activities, cumulative traffic impacts would be less than significant.

5.2.11 Hazardous Materials and Waste Handling and Disposal

The proposed action would not result in increased risks to public safety. In addition, none of the projects listed in Table 5-1 would occur in the vicinity of the proposed ADA activity area. The nearest cumulative project would occur approximately 30 miles south of the nearest ADA site (i.e., Coyote Springs Housing Development). Therefore, safety risks associated with the proposed ADA activities would not contribute to a cumulatively considerable impact.

5.2.12 Cultural Resources

The proposed ADA activities would not significantly impact cultural resources. As the proposed ADA activities are short-term, any effects on cultural resources would be temporary and would terminate upon completion of the activity. In order to avoid permanent impacts to cultural resources, the proposed ADA activities would avoid all known cultural resources in the region. Any potential impacts associated with cultural resources would be short-term, and the proposed ADA activities would not contribute cumulatively to projects that would occur after completion of the two-week exercise. The only cumulative project that may occur simultaneously is the Coyote Springs Housing Development, located approximately 30 miles south of the proposed ADA sites. Since potential effects to cultural resources would be localized at the ADA sites, the proposed ADA activities would not contribute to a cumulative effect on cultural resources.

5.2.13 Utilities

The proposed ADA activities would have no impacts on utilities. As such, the proposed ADA activities would not contribute to an incremental impact on utilities that would be cumulatively considerable.

6. AGENCY COORDINATION

For purposes of preparing this EA, the following agencies were consulted:

Agency	Name
Federal	
U.S. Army Corps of Engineers	Priscilla Perry Alex Watt Timothy Kennedy Gail Campos John Killeen
U.S. Fish and Wildlife Service	Michael Burroughs Cynthia Martinez Amy La Voie
U.S. Department of Interior Bureau of Land Management	Jeffery Weeks William Smith Dan Netcher Domenic Bolognani Bruce Winslow Susan Baughman Troy Grooms Karen Prentice Brad Pendly Nate Thomas John Longinetti
State of Nevada	
Public Utilities Commission of Nevada	Mark Harris of the Carson City Office
Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Corrective Actions	Jennifer Carr, Remediation Program
Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Water Pollution and Control	Cliff Lawson
Department of Conservation and Natural Resources, Nevada Natural Heritage Program	Eric Miskow Jim Morfield Ralph Phenix
Nevada Department of Transportation	Kelley (Overdimensional Permits)
Nevada Division of Environmental Protection	Randy Phillips, Bureau of Air Pollution Control
Nevada Division of Wildlife	Christine Klinger Larry Neal
Clark County	
Clark County Department of Air Quality Management	Pravin Pema
Lincoln County	
Lincoln County Building and Planning Department	Kelly Harris Ken Dixon

7. COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

7.1 RELEVANT FEDERAL, STATE, AND LOCAL STATUTES, LAWS, AND GUIDELINES

The following section provides a brief summary of the laws, regulations, Executive Orders, and other guidelines that are relevant to the proposed ADA activities and alternatives. Included in this summary is a discussion of the consistency of the proposed ADA activities with each of the plans, policies, and regulations listed below.

Federal Laws and Regulations

National Environmental Policy Act of 1969

NEPA requires that all Federal agencies consider potential environmental consequences of proposed actions in their decision-making process. Under the Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR 1500-1508), Federal agencies are required to prepare an EA in order to:

- Briefly provide sufficient analysis and evidence for determining whether to prepare an EIS or a Finding of No Significant Impact (FONSI); or
- Aid in an agency's compliance with NEPA when an EIS is deemed unnecessary.

The U.S. Army NEPA counterpart regulation is AR 200-2. This regulation specifies that an EA be prepared to:

- Briefly provide sufficient evidence and analysis for determining whether to prepare an EIS or a FONSI.
- Aid in an agency's compliance with NEPA when no EIS is necessary.
- Facilitate preparation of an EIS when one is necessary.

The USAF NEPA counterpart is 32 CFR 989.14. When a proposed action is one not usually requiring an EIS but is not categorically excluded, the Environmental Planning Function (EPF) supports the proponent in preparing an EA (40 CFR 1508.9). Every EA must lead to either a FONSI, a decision to prepare an EIS, or no action on the proposal. Whenever a proposed action requires an EIS, the EPF responsible for the EIAP may prepare an EA.

Under the proposed ADA activities, any potential impact would be mitigated to a less-than-significant level with the implementation of SOPs. These SOPs would be included as mitigation measures in the FONSI that would be prepared for the proposed ADA activities. As an EA is the appropriate vehicle for analysis of the proposed ADA activities, the proposed ADA activities would be compliant with NEPA.

Air Quality

Clean Air Act (Amendments 42 USC § 7401–7671)

The Clean Air Act (CAA) is intended to "protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." The CAA of 1970 directs the attainment and maintenance of NAAQS. The 1990 Amendments to this Act determine attainment and maintenance of NAAQS (Title I), motor vehicles and fuel reformulation (Title

II), hazardous air pollutants (Title III), acid deposition (Title IV), operating permits (Titles V), stratospheric ozone protection (Title VI), and enforcement (Title VII). The USEPA also implements the NAAQS and determines attainment of federal air quality standards on a short- and long-term basis. The Las Vegas Valley portion of the study area (within Clark County) is in serious non-attainment of the PM10 and CO NAAQS and is in attainment of all other NAAQS; except for the 8-hour ozone standard for which it has been designated as basic nonattainment. As activities that would occur within the nonattainment area would be conducted in compliance with all CCDAQM rules and regulations, the proposed ADA activities would not conflict with the CAA.

The Federal General Conformity Rule (40 CFR Part 93, Subpart B) requires that any actions funded, approved, or licensed by the Federal government conform to the applicable SIP (USEPA, 1993). The 8-hour ozone NAAQS non-attainment designation for the Las Vegas Valley was finalized and became effective on June 15, 2004, but conformity will not be based on the 8-hour non-attainment designation until one year after the effective date of the 8-hour designation, or June 15, 2005 (USEPA, 2003 and 2004a). Therefore, for the proposed ADA activities, this rule would require a conformity determination if the ADA activities' direct and indirect emissions within the Las Vegas PM10 and CO nonattainment areas are more than 70 tons and 100 tons, respectively. General Conformity is only addressed for the proposed ADA activities. The activities and emissions that would occur under the proposed ADA activities would in no way conflict with or obstruct implementation of the current CCDAQM Nonattainment Area Plans or other relevant portions of the state of Nevada SIP (see Section 4.1, Air Quality).

Biological Resources

Endangered Species Act of 1973, 1988 Amendments (16 USC § 1531 et seq)

The ESA protects threatened and endangered plant and wildlife species by prohibiting actions on Federal property that would jeopardize the continued existence of such species, or by minimizing actions that would result in the destruction or adverse modification of any critical habitat of such species. The proposed ADA activities have been designed to avoid endangered or threatened plant and wildlife species that may occur in the area (see Section 3.2, Biological Resources). Since desert tortoise has the potential to occur along one of the proposed access roads the USACE has prepared a Biological Assessment to evaluate potential impacts to this species. Based in consultation with the USFWS measures incorporated into the project design and SOPs would minimize impacts to this species. As there would be no significant impact to endangered or threatened plant and wildlife and sensitive habitats, the proposed ADA activities would not conflict with the ESA.

Migratory Bird Treaty Act of 1972

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, hunt, capture, kill, or possess or attempt such an action towards any bird listed in wildlife protection treaties between the United States and several countries including Great Britain, Mexico, Japan, and countries that are part of the former Soviet Union. A "migratory bird" includes the living bird, any part of the bird, its nests or eggs.

Disturbance of the nest of a migratory bird requires a permit issued by the USFWS pursuant to CFR Title 50. Almost all birds, except for some nonnative pests, are covered by the Act. The administering agency is the USFWS. Bird species known to occur in the vicinity of the project include burrowing owl (*Athene cunicularia*) and ferruginous hawk (*Buteo regalis*). However, SOPs incorporated into the proposed ADA activities would avoid impacts to these species (see Section 4.2, Biological Resources). The proposed ADA activities would not conflict with this Act.

Water Resources and Hydrology

Clean Water Act of 1977 (33 USC § 1251 et seq.)

The Clean Water Act (CWA) was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The definition of waters of the United States includes wetland areas "that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). **Section 401** of the CWA requires Federal agencies to obtain state water quality certification from the state in which the proposed action would take place if impacts to these resources would occur. As the proposed ADA activities would implement the SOPs listed in Section 2.3, the proposed activities would not violate state and Federal water quality standards and would be consistent with the CWA. In addition, impacts to waters of the United States would not occur, and no state water quality certification would be required. **Section 402** establishes conditions and permitting for point-source discharges of pollutants under the National Pollution Discharge Elimination System (NPDES). In Nevada, NPDES permitting authority is delegated to, and administered by, the Nevada Division of Environmental Protection. Pursuant to NPDES requirements, a General Construction Storm Water Permit is required for construction activities. Based on the activities identified in the proposed ADA activities the Nevada Division of Environmental Protection (NDEP), Bureau of Water Pollution Control has indicated that a Storm Water Pollution Prevention Plan (SWPPP) would not be required for the proposed ADA activities (NDEP, 2005). **Section 404** of the CWA regulates the discharge of dredged or fill materials into the waters of the United States, including rivers, streams, and wetlands, except as permitted under separate regulations by the USACE and the USEPA. The USACE administers the Section 404 permit program. The proposed ADA activities would not include digging; therefore, no dredged or fill materials would be discharged and no violation of Section 404 of the CWA would occur.

Executive Order 11988, Floodplain Management (42 CFR 26961)

Signed May 24, 1977, Executive Order 11988 requires that governmental agencies, in carrying out their responsibilities, provide leadership and take action to restore and preserve the natural and beneficial values served by floodplains. Before proposing, conducting, supporting or allowing an action in a floodplain, each agency is to determine if planned activities will affect the floodplain and evaluate the potential effects of the intended action on its functions. In addition, agencies shall avoid locating development in a floodplain to avoid adverse effects in the floodplains. In order to mitigate impacts to

the water quality and hydrology in the area, the proposed ADA activities would implement the SOPs listed in Section 2.3. The proposed ADA activities would not conflict with Executive Order 11988.

Executive Order 11990, Protection of Wetlands (42 CFR 26951)

Signed May 24, 1977, Executive Order 11990 requires governmental agencies, in carrying out their duties, to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands. The proposed ADA activities would not occur within the vicinity of any wetlands. As such, there would be no conflict with Executive Order 11990.

Noise

Noise Control Act of 1972 (42 USC § 4901-4918)

The Noise Control Act directs all Federal agencies to carry out, "to the fullest extent within their authority," programs within their jurisdictions in a manner that furthers a national policy of promoting an environment free from noise that jeopardizes health and welfare. The USEPA identifies a 24-hour exposure level of 70 dB as the level of environmental noise which will prevent any measurable hearing loss over a lifetime (USEPA, 1974). Levels of 55 dBA (Ldn) outdoors and 45 dBA (Ldn) indoors were identified as preventing activity interference and annoyance. These levels are not standards, criteria, regulations, or goals, and should be viewed as levels, below which there is no reason to suspect that the general population will be at risk from any of the identified effects of noise. In order to minimize noise impacts, the proposed ADA activities would implement the SOPs listed in Section 2.3. The proposed ADA activities would be consistent with this Act.

U.S. Department of Labor Occupation Safety & Health Administration (29 CFR 1910.95)

The U.S. Department of Labor Occupation Safety & Health Administration (OSHA) (29 CFR 1910.95) requires protection against the effects of noise exposure when sound levels exceed those shown in Table 7-1 (OSHA, 2004). Feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table 7-1, personal protective equipment shall be provided to reduce sound levels within the levels of the table. In order to minimize noise impacts, feasible administrative or engineering controls shall be utilized and personal protective equipment shall be provided if necessary to reduce sound levels to comply with the levels listed in Table 7-1. The ADA activities would not conflict with OSHA standards.

Table 7-1: Permissible Noise Exposures

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

Source: OSHA, 2004

Socioeconomics

American Indian Religious Freedom Act (42 USC § 1996)

The American Indian Religious Freedom Act established Federal policy to protect and preserve the rights of Native Americans to believe, express, and exercise their traditional religions, including providing access to sacred sites. In order to avoid impacts to Native Americans, the environmental staff at NAFB will coordinate with the State Historic Preservation Office (SHPO).

The environmental criteria and SOPs discussed in Section 2 would avoid potential conflicts with the American Indian Religious Freedom Act. Consequently, the proposed ADA activities would be consistent with this Act.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Executive Order 12898 identifies and addresses disproportionately high and adverse human health or environmental effects resulting from the programs, policies, or activities of Federal agencies on minority populations and low-income populations within the United States. The Order is further intended to provide information access and public participation relating to potential impacts to these populations. As discussed in Section 4.9, Socioeconomics, the proposed ADA activities would not create socioeconomic impacts within the adjacent communities. There would be no conflict with Executive Order 12898.

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks.

Executive Order 13045 requires Federal agencies to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and to ensure that the agencies' policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. As discussed in Section 4.9, Socioeconomics, the proposed ADA activities would not create environmental health and/or safety risks, and therefore would not disproportionately affect children. There would be no conflict with Executive Order 13045.

Hazardous Materials and Waste Handling and Disposal

Resource Conservation and Recovery Act of 1976 (42 USC § 6901)

Resource Conservation and Recovery Act (RCRA) was enacted to ensure the safe and environmentally responsible management of hazardous and nonhazardous solid waste, and to promote resource recovery techniques to minimize waste volumes. To ensure responsible management of hazardous and nonhazardous waste, the SOPs listed in Section 2.3 as well as the use of a HAZMART would be integrated into the proposed ADA activities. Therefore, the proposed ADA activities would be consistent with this Act.

Hazardous Waste and Solid Waste Amendments Act of 1984 (42 USC § 6901).

The Hazardous Waste and Solid Waste Amendments Act of 1984 are amendments to the RCRA and the Solid Waste Disposal Act that authorize regulations or require that regulations be promulgated on waste minimization, land disposal of hazardous wastes, and underground storage tanks. In order to minimize waste impacts, the proposed ADA activities would implement the SOPs listed in Section 2.3. There would be no conflict with this Act.

Comprehensive Environmental Response, Compensation and Liability Act of 1980 (42 USC § 9601)

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) provides a statutory framework for the cleanup of waste sites containing hazardous substances and, as amended by the Superfund Amendments in 1986 and Reauthorization Act, provides an emergency response program in the event of a release (or threat of a release) of a hazardous substance to the environment. CERCLA's goal is to provide for response and remediation of environmental problems that are not adequately covered by permit programs of other environmental laws, such as the CAA, the CWA, the RCRA, and the Atomic Energy Act. In order to minimize hazardous waste impacts, the proposed ADA activities would implement the SOPs listed in Section 2.3. There would be no conflict with this Act.

Emergency Planning and Community Right-to-Know Act of 1986 (42 USC § 11001)

This act was included as Title III of the Superfund Amendments and Reauthorization Act. Under Subtitle A of this Act, Federal facilities provide information regarding inventories of specific chemicals used or stored, and releases that occur from these sites, to the State Emergency Response Commission and to the Local Emergency Planning Committee to ensure that emergency plans are sufficient to respond to unplanned releases of hazardous substances. In addition, under Subtitle B of the Act, material safety data sheet reports, emergency and hazardous chemical inventory reports, and toxic chemical release inventory reports must be provided to appropriate state, local, national, and federal authorities. In order to minimize hazardous waste impacts, the proposed ADA activities would implement the SOPs listed in Section 2.3. There would be no conflict with this Act.

Toxic Substances Control Act of 1976 (15 USC § 2601, et seq.)

The Toxic Substances Control Act (TSCA) provides the USEPA with the authority to require testing of both new and old chemical substances entering the environment and to regulate them where necessary. In order to be consistent with this Act, the proposed ADA activities would implement the SOPs listed in Section 2.3.

Hazardous Materials Transportation Act

Department of Transportation (DOT) regulations, as specified in 49 CFR Parts 100-178, are followed for the transportation of hazardous materials. In order to comply with this Act, drivers of vehicles transporting hazardous or non-hazardous materials would be required to have Nevada commercial vehicle operator licenses. The proposed ADA activities would be consistent with this Act.

Cultural Resources

National Historic Preservation Act of 1966 (16 USC § 470)

The National Historic Preservation Act established the National Register of Historic Places and the Advisory Council on Historic Preservation and outlined procedures for management of cultural resources on Federal property. The proposed ADA activities would avoid potential impacts to cultural resources through the implementation of the environmental criteria and SOPs discussed in Section 2. Consequently, the proposed ADA activities would be consistent with this Act.

Bureau of Land Management

Biological Resources

Instruction Memorandum (IM) NV-040-2001-02

The BLM Ely District has a policy regarding the "no activity" period for all management actions in migratory bird habitat. The "no activity" period for the Ely District has been set at May 1 to July 15 of each year. The policy also contains actions that must occur if management actions that do occur during the "no activity" period. As the proposed ADA activities would not occur during this time period there would be no conflict with this regulation.

43 CFR 4700: Protection, Management, and Control of Wild Free-Roaming Horses and Burros

The policies under 43 CFR 4700 serve to implement the Wild Free-Roaming Horses and Burros Act of 1971. According to these policies, wild horses and burros are to be managed as self-sustaining populations of healthy animals that are in balance with their habitat, and the goal of subsequent management activities is to maintain free-roaming behavior. BLM is required to involve Federal and state wildlife agencies and all other affected interests in the planning and management of wild horse and burros on BLM land. As stated in Section 4.2, Biological Resources, the proposed ADA activities would not significantly impact any wild horses and burros that may be found near the ADA sites. The proposed ADA activities would be consistent with this policy.

Instruction Memorandum (IM) NV-040-2000 04: Noxious Weeds

The BLM has a policy regarding the spread of noxious weeds. No noxious weeds were identified at any of the proposed ADA sites, although three populations of noxious plants were identified in the Dry Lake Valley. Actions incorporated into the project description and SOPs would ensure the activities of the proposed ADA units remain in compliance with policy.

Land Use

IM 2001-030, Change 1 Supplemental Guidance - Military Activities On and Over the Public Lands (2002)

This IM gives priority to processing requests for new military training or testing authorizations related to the "War on Terrorism" or "Homeland Defense" (DOI, 2002). While this IM was scheduled to expire in 2003, it remains in effect until the new IM is issued. In order to comply with the IM, the proposed ADA activities would be limited to the use of radar or similar systems for tracking of training missions at selected sites. No live ordinance or off road military maneuvers would be authorized. As vehicles would remain within 50 meters of established roads and no maneuvers would occur there would be no conflict with this IM.

43 CFR 1600: Planning Regulations

This proposed land use planning regulation would modify BLM's current planning regulations to emphasize the importance of working with Federal and state agencies and local and tribal governments through cooperating agency relationships in developing, amending, and revising the BLM's resource management plans. This planning regulation has not yet been approved by the BLM (DOI, 2004b).

Farmland Protection Policy Act

The Farmland Protection Policy Act was enacted to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to assure that Federal programs are administered in a manner that will be compatible with state, local, and private programs and policies to protect farmland. The Act pertains specifically to prime farmland, unique farmland, or farmland of statewide or local importance, as defined by the Act (Public Law 97-98, 7 USC § 4201). As the proposed ADA activities would not impact prime farmland, unique farmland, or farmland of statewide or local importance or substantially impact agricultural activities. As such, there would be no conflict with this Act.

Recreation

Bureau of Land Management's Mountain Bike Strategy (1992)

This policy requires BLM to permit mountain bicycling on all roads and trails unless designated closed to bicyclists (BLM, 1992). No mountain biking would occur as part of the proposed ADA activities ADA Patriot sites would be clearly marked (flagged) to signal to bicyclists that they are closed during the ADA activities.

National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands (2001)

The purpose of this Plan is to determine and implement better motorized off-highway vehicle management solutions that are designed to conserve soil, wildlife, water quality, native vegetation, air quality, heritage resources, and other resources, while providing for appropriate motorized recreational opportunities. BLM has designated its management areas as "open," "limited," or "closed" to off-road vehicles (BLM, 2001). The proposed ADA activities would occur on lands approved by BLM or within 50 meters (164 feet) of existing access roads and would not conflict with this Plan.

State Regulations

Nevada State Law

Air Quality

The NDEP has jurisdiction in Lincoln County. The NDEP's Bureau of Air Pollution Control (BAPC) has been delegated responsibility for implementing most of the CAA regulations and the Bureau of Air Quality Planning (BAQP) is responsible for air quality planning including submittal of the SIP. Most of the existing SIP is 20 to 30 years old. The proposed ADA activities would not trigger any permitting requirements under BAPC rules and regulations (NDEP, 2004b).

Biological Resources

Nevada State law established in 1969 per Nevada Revised Statues (NRS) 527.260-.300 provides "a program for the conservation, protection, restoration, and propagation of selected species of flora and for the perpetuation of the habitats of such species." The State Forester Fire Warden (SFF) has the authority to list native plant taxa as "threatened with extinction" and to prohibit removal or destruction of such species except by special permit from the SFF per Nevada Administrative Code (NAC) 527.090. "List of fully protected species of native flora" defined (NRS 527.050, 527.300). "List of fully protected species of native flora" means the list of critically endangered species of native flora that may not be removed or destroyed except pursuant to a permit issued by the state forester. Several of the special status wildlife species listed in Table 3.2-3 are listed as protected by the State of Nevada. While Nevada does not have its own version of an endangered species act, the Nevada Division of Wildlife has established a list of species which are either declining in all or portions of their range within Nevada. As discussed in Section 4.2, Biological Resources, the proposed ADA activities would not conflict with NRS 527.260-.300.

Under Nevada State law, it is illegal to "cut, destroy, mutilate, remove, or possess any Christmas (evergreen) tree, cactus (Cactaceae), yucca (*Yucca*) or branches thereof…" from state, county, or private lands without permission from the SFF (NRS 527.060-.120). The proposed ADA activities have been designed to avoid these species. With the SOPs listed in Section 2.3, the proposed ADA activities would not conflict with this law.

Water Resources and Hydrology

Criteria for water quality within the State of Nevada are contained in the NAC, Chapter 445A.119, and apply to existing and designated beneficial uses of surface water bodies. Water quality standards are driven by the beneficial uses of specific water bodies. Beneficial uses include agriculture (irrigation and livestock watering), aquatic life, recreation (contact and non-contact), municipal or domestic supply, industrial supply, and wildlife propagation. With implementation of the SOPs listed in Section 2.3, the proposed ADA activities would have no affect on water quality.

Transportation

Large military vehicles involved in the proposed ADA activities will require Overdimensional Permits (Section 484.500) from the Nevada Department of Transportation. Any vehicles exceeding 2.6-meters wide; 21-meters in length; 4.3-meters high (8-feet, 6-inches wide; 70-feet in length; 14-feet high); or 36,287 kilograms (80,000 pounds or 40 tons) must receive an overdimensional permit. These permits will be acquired as necessary for the ADA activities.

Hazardous Materials and Waste Handling and Disposal

The Nevada Division of Environmental Protection, Bureau of Waste Management administers the Chemical Accident Prevention Program (CAPP) under NRS 459.380 to 459.3874 (NDEP-BWM, 2004). The Nevada Division of Environmental Protection, Bureau of Corrective Actions tracks LUST as well as Corrective Action (non-regulated) sites (NDEP-BCA, 2004a). NAC Chapter 444 provides provisions for the disposal of hazardous wastes (Sections 850-8746) and solid waste (Sections 570-748). As discussed in Section 3.11, Hazardous Materials and Waste Handling and Disposal, none of proposed ADA sites or the LSA would be located on or near a potential hazardous waste site.

Local Regulations

Air Quality

Clark County Air Quality Management Plans

The CCDAQM prepared a revised Serious CO Nonattainment Area Plan in 2000 that was approved as part of the State of Nevada SIP revision by USEPA in June, 2004 (CC, 2000); and CCDAQM prepared a revised Serious PM_{10} Nonattainment Area Plan in 2001 that was approved by USEPA in May, 2004 (CC, 2001). The CO plan primarily focuses on control measures that will reduce CO emissions from gasoline fueled vehicles through the use of cleaner fuels and improving the motor vehicle inspection program. The PM10 plan primarily focuses on control measures that control fugitive dust emissions from construction, vehicle travel on unpaved and paved roads and wind blown dust emissions from certain unpaved and disturbed areas. Additionally, the Las Vegas Area was designated as a basic nonattainment area for the 8-hour ozone standard effective September 13, 2004. This designation will require the CCDAQM to prepare an 8-hour ozone attainment plan. The proposed ADA activities would not conflict with the Clark County Air Quality Management Plans.

CCDAQM Rules and Regulations

The ADA activities within Clark County would be limited to initial mobilization at NAFB and vehicle traffic emissions due to travel from NAFB to Lincoln County. There would be no new stationary sources operating within Clark County that would require permits as part of the ADA activities, nor any construction activities subject to CCDAQM regulations. However, there is one general air quality regulation that may apply during the mobilization activities at NAFB (CCDAQM, 2004b):

Section 45 – Idling of Diesel Powered Motor Vehicles

This regulation limits idling of diesel powered motor vehicles to no more than 15 consecutive minutes. With implementation of the SOPs listed in Section 2.3, the proposed ADA activities would comply with all CCDAQM rules and regulations.

Land Use

Caliente Management Framework Plan (1980)

The Caliente Management Framework Plan is intended to guide resource management on public lands administered by the BLM within the Caliente area of the Ely District. The plan identifies sensitive areas that may be impacted by recreational activities. The Caliente Management Framework Plan is currently being revised to include management strategies for the Desert Tortoise habitat, and will be consolidated into the Ely Resource Management Plan (BLM, 2004). The proposed ADA activities would not conflict with this Plan as no ADA sites are located in the Caliente area.

Lincoln County Master Plan (Adopted August 20, 2001)

The Lincoln County Master Plan guides future growth, management of natural resources, provision of public services and facilities, and the protection of the public's health, safety, and welfare for the unincorporated areas of Lincoln County (Lincoln County, 2001). The Plan includes short, medium, and long term goals and policies for a 20 year planning horizon (2000-2020). As stated in Section 4.6, Aesthetics, and Section 4.5, Land Use, the proposed ADA activities would not conflict with this Plan.

Lincoln County Public Land and Natural Resource Management Plan (Adopted December 5, 1997)

The Public Land and Resource Management Plan is intended to guide the use of public lands and public resources in Lincoln County and to protect the rights of County residents on private and public lands (Lincoln County, 1997). The Plan does not discuss military use of public lands within Lincoln County; therefore, the proposed ADA activities would not conflict with this Plan.

Aesthetics

Lincoln County Policy CNR-1G

Lincoln County Policy CNR-1G requires that all proposed development should be designed to be compatible with riparian areas and playas to protect wildlife habitat, floodways, water quality and

quantity and scenic values. New development should be consistent with adopted guidelines. The proposed ADA activities do not involve the development of lands and avoid riparian areas and playas. Therefore, the proposed ADA activities would not conflict with Lincoln County Policy CNR-1G.

8. LIST OF PREPARERS AND REVIEWERS

8.1 LIST OF PREPARERS AND REVIEWERS

PREPARERS

Name	Sections	Background
Chris Huntley Aspen Environmental Group	Project Manager, Aesthetics, Biological Resources, Project Description, Alternatives, Cumulative Projects, Agency Coordination	M.S. Biology (in progress) B.A Biology Years of Experience: 12
Lisa Blewitt Aspen Environmental Group	Noise, Hazardous Materials and Waste Handling and Disposal, Transportation, Utilities	B.S. Chemical Engineering Years of Experience: 8
Tatiana Inouye Aspen Environmental Group	Land Use, Recreation, Socioeconomics, Compliance with Environmental Requirements	M.E.S.M (Environmental Science and Management) B.S. Biology Years of Experience: 4
Timothy Kennedy USACE	Environmental Coordinator, Project Description, Alternatives	B.A. Geology Years of Experience: 13
Carolina Morgan Aspen Environmental Group	Earth Resources, Water Resources	M.E.S.M (Environmental Science and Management) B.S. Earth System Science and Policy Years of Experience: 2
Kathleen Robertson Aspen Environmental Group	Cumulative Projects	M.P.A. (Public Administration) B.U.E.P., Urban and Environmental Planning Years of Experience: 3
Will Walters, P.E. Aspen Environmental Group	Air Quality	B.S. Chemical Engineering Years of Experience: 18
Judy Spicer	Document Production Coordinator	B.A. English Years of Experience: 25
Kati Simpson	Graphic Artist	B.A. Geography Years of Experience: 19
Craig Hattori	Graphic Artist	B.A. Philosophy Years of Experience: 15
John Killeen, R.P.A. USACE	Cultural	M.A. (Anthropology and Archaeology) Years of Experience: 20

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Name	Agency	Title
Alex Watt	USACE	Chief, Environmental Resources Branch
Nedenia Kennedy	USACE	Chief, Environmental Policy Group
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Maj. D. Garcia	USAF	Chief, Range Engineering ACC/DORR Ranges, Airfields, and Airspace Ops Div
Naresh Kapur	FORSCOM	Environmental Engineer
Ed Hill	FORSCOM	NEPA Manager
Jim Campe	USAF	NEPA Program Manager
Bob Turner	USAF	Biologist
Roger Schofield	USAF	98th Range Wing
Maj. Charles Duray	U.S. Army	Operations Officer, 2-43 Air Missile Defense Battalion

9. DISTRIBUTION LIST

This EA was distributed for a seven day public comment period, in compliance with USAF regulations. A Notice of Availability was published in a local newspaper, the Lincoln County Weekly, to notify interested public individuals of the availability of the document and the locations where it was available for review. Several public agencies and the local public library in the community of Alamo received a copy of the EA. During this review period, individuals and public agencies were invited to comment on the adequacy of the EA. No public comments were received on the Draft EA.

The agencies, organizations, and public libraries that received a copy of this document are as follows:

Bureau of Land Management
HC 33 Box 33500
Ely, Nevada 89301

United States Army Corps of Engineers
Planning Division, Los Angeles District
P.O. Box 532711
Los Angels, 90053

United States Army Forces Command
ATTN: AFEN
1777 Hardee Avenue
Fort McPherson, Georgia 30330-1062

Nellis Air Force Base
98 RANS/RSC GIS
3770 Duffer Drive (Bldg 200)
Nellis AFB, Nevada 89191

United States Fish and Wildlife Service
4701 North Torrey Pines Drive
Las Vegas, Nevada, 89130

Alamo Annex Building and Public Library
100 South First Street West
Alamo, Nevada 89001

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APPENDICES

APPENDIX A.

AIR QUALITY

A.1 Air Pollutant Calculations

A.2 General Conformity Analysis

APPENDIX A.1

AIR POLLUTANT CALCULATIONS

AIR POLLUTANT CALCULATIONS

Introduction

The air pollutant emissions for each alternative were estimated. The project scope for each alternative was used to form a basis of comparison when estimating the emissions for each alternative. The number and type of on-road equipment and associated emission sources were determined through a review of Air Defense Artillery Reference Handbook (U.S. Army, 2000) and through consultation with the USACE.

The estimated quantity of on-road traffic trips and vehicles miles traveled over paved and unpaved surfaces for the proposed ADA activities and project alternatives is provided in Table A.1-1.

Air Pollutant Emission Calculation Methodology

The air pollutant emission estimate methodology can be broken up into three separate subcategories: (1) On-road vehicle tailpipe emissions; (2) fugitive dust emissions (includes both paved and unpaved road travel); and (3) diesel-fueled generator emissions.

The on-road emission factors were determined using CARB's EMFAC2002 model (CARB, 2004). The EMFAC model was used to develop emission factors for the specific speeds that are estimated for specific paved and unpaved road travel segments. Additionally, the EMFAC2002 model was used to determine vehicle idle emissions. Table A.1-2 presents the summary of the on-road emission factors and Table A.1-3 presents the calculated on-road travel emissions.

Fugitive dust emissions were calculated using the AP-42 calculations for paved and unpaved roads (USEPA, 2004d). No mitigation was assumed. Other assumptions and the final calculated paved and unpaved road fugitive dust emission factors and emissions are presented in Table A.1-4.

The diesel-fueled generator emission factors were developed using the emission factors and emission factor adjustments provided in USEPA's *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression-Ignition* (USEPA, 2002) reference. Emission factors were developed based on the conservative assumption that the engines would meet baseline Tier 1 engine emissions. The Tier 1 standards took effect from 1996 to 2000 for the engine sizes assumed to be used during the Proposed Action. Other emission factor assumptions include: (1) the use of low sulfur, but not ultra-low sulfur, diesel fuel (140 ppm sulfur by weight, same as on-road EMFAC2002 default assumption); and (2) no emission factor adjustment for engine deterioration based on the fact that there would be engines of higher Tiers than the Tier 1 base assumed in the equipment mix that would more than compensate for the deterioration in performance of individual engines. The diesel-fueled generator emission factor and emission estimate summary is presented in Table A.1-5.

The on-road, fugitive dust emission, and diesel-fueled generator emission estimates were combined for each alternative to estimate the total project emissions. The emission summary is provided in Table A.1-6.

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Table A.1-1
Vehicle Miles Traveled VMT Estimate

Alternative	Paved Road VMT			Unpaved Road VMT			Total VMT
	LHDT VMT	MHDT VMT	HHDT VMT	LHDT VMT	MHDT VMT	HHDT VMT	
Proposed Exercise	18,104	10,758	26,672	8,484	1,502	4,264	69,784
Alternative A	9,412	5,819	13,786	4,250	761	2,142	36,170
Alternative B	14,546	8,696	20,124	6,478	1,144	3,208	54,196

Notes:
LHDT1 = Light Heavy-Duty Trucks (8501-10000 lb GVWR) = Humvee
MHDT = Medium Heavy Duty Trucks (14,001-33,000 GVWR) = M900 Series 5-ton Trucks
HHDT = Heavy-Heavy-Duty Trucks (33,001+ lb GVWR) = M970/980 HEMTT Heavy Trucks

Table A.1-2
Vehicle Emission Factors and Travel Summary

Emission Factor Summary

Pollutant	Vehicle Type	Idle g/hour	20 mph g/mi	30 mph g/mi	55 mph g/mi
PM10	LHDT1	1.258	0.102	0.08	0.061
PM10	MHDT	1.667	0.491	0.36	0.241
PM10	HHDT	2.003	0.544	0.405	0.278
NOx	LHDT1	80.7	6.055	5.344	7.276
NOx	MHDT	80.7	11.255	9.933	13.526
NOx	HHDT	80.7	15.862	13.998	19.062
VOC	LHDT1	5.017	0.453	0.326	0.21
VOC	MHDT	5.017	0.541	0.389	0.251
VOC	HHDT	5.017	1.246	0.896	0.577
CO	LHDT1	26.3	1.2	0.785	0.601
CO	MHDT	26.3	2.96	1.935	1.483
CO	HHDT	26.3	4.506	2.946	2.257
SO2	LHDT1	0.356	0.045	0.045	0.045
SO2	MHDT	0.356	0.131	0.131	0.131
SO2	HHDT	0.356	0.188	0.188	0.188

Source: CARB EMFAC 2000

Vehicle Travel Summary

		VMT		
Vehicle Type	**Idle Hours**	**20 mph**	**30 mph**	**55 mph**
Proposed Action - Clark County				
LHDT1	25	0	250	2,250
MHDT	22	0	220	1,980
HHDT	59	0	585	5,265
Proposed Action - Lincoln County				
LHDT1	709	8,484	0	15,604
MHDT	22	1,502	0	8,558
HHDT	59	4,264	0	20,822
Alternative B - All				
LHDT1	371	4,250	115	9,297
MHDT	22	761	110	5,709
HHDT	69	2,142	345	13,441
Alternative C - All				
LHDT1	578	6,478	190	14,356
MHDT	34	1,144	170	8,526
HHDT	97	3,208	485	19,639

Notes:
LHDT1 = Light Heavy-Duty Trucks (8501-10000 lb GVWR) = Humvee
MHDT = Medium Heavy Duty Trucks (14,001-33,000 GVWR) = M900 Series 5-ton Trucks
HHDT = Heavy-Heavy-Duty Trucks (33,001+ lb GVWR) = M970/980 HEMTT Heavy Trucks

Table A.1-3
Vehicle Travel Emission Summary

Alternative	Emissions (tons)				
Proposed Action	**NOx**	**CO**	**VOC**	**SOx**	**PM10**
Clark County	0.18	0.02	0.01	0.00	0.00
Lincoln County	0.91	0.14	0.03	0.01	0.02
Total	1.09	0.16	0.04	0.01	0.02
Alternative B	0.57	0.08	0.02	0.01	0.01
Alternative B	0.84	0.12	0.03	0.01	0.01

Note: tailpipe emissions only, road dust emissions presented separately

Table A.1-4
Fugitive Dust Emission Factor and Emission Calculation

Unpaved Road Dust Emission Factor Calculation

Vehicle Wt. Avg. Tons	Soil Silt (%)	EF lb/VMT	Proposed Action		Alternative B		Alternative C	
			VMT	PM10 tons	VMT	PM10 tons	VMT	PM10 tons
15	10	2.63	14,250	18.71	7,153	9.39	10,830	14.22

Paved Road Dust Emission Factor Calculation

Vehicle Wt. Avg. Tons	Silt Load g/m2	EF g/mi	Proposed Action		Alternative B		Alternative C	
			VMT	PM10 tons	VMT	PM10 tons	VMT	PM10 tons
20	0.2	0.061	55,534	1.70	29,017	0.89	43,366	1.33

Clark County Paved Road Dust	VMT	PM10 tons
Proposed Action	10,550	0.32

Silt Loading is worst case assumption neglecting high ADT roads in Clark County

Table A.1-5
Stationary Source Emission Factors and Emission Estimates

Proposed Action	Equipment Assumptions			Emission Factors g/bhp					Load	Equipment Usage			Horsepower	Total Generator Emissions Tons				
									(fraction)	(hr/day)	(days)	(pieces)	Hours					
Generator Emissions	**HP**	**HP Cat.**	**Tier**	NOx	CO	VOC	SOx	PM10						**NOx**	**CO**	**VOC**	**SOx**	**PM10**
EPP Generators	210	175-300	1	5.58	0.75	0.31	0.0455	0.20	0.75	24	12	4	181,440	1.12	0.15	0.06	0.01	0.04
Launching Station Generators	22	16-25	1	4.44	2.16	0.44	0.0505	0.21	0.75	4	12	16	12,672	0.06	0.03	0.01	0.00	0.00
ICC and CRG Generators	45	25-50	1	4.73	1.53	0.28	0.0506	0.28	0.75	24	12	8	77,760	0.41	0.13	0.02	0.00	0.02
Sentinel Generators	15	11-16	1	4.44	2.16	0.44	0.0505	0.21	0.75	12	12	2	3,240	0.02	0.01	0.00	0.00	0.00
LDS Generators	45	25-50	1	4.73	1.53	0.28	0.0506	0.28	0.75	24	12	6	58,320	0.30	0.10	0.02	0.00	0.02
Emission Factors are based on EPA Guidance Document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling — Compression-Ignition".														1.90	0.42	0.11	0.02	0.09

Alternative B	Equipment Assumptions			Emission Factors g/bhp					Load	Equipment Usage			Horsepower	Total Generator Emissions Tons				
									(fraction)	(hr/day)	(days)	(pieces)	Use					
Generator Emissions	**HP**	**HP Cat.**	**Tier**	NOx	CO	VOC	SOx	PM10						**NOx**	**CO**	**VOC**	**SOx**	**PM10**
EPP Generators	210	175-300	1	5.58	0.75	0.31	0.0455	0.20	0.75	24	12	2	90,720	0.56	0.07	0.03	0.00	0.02
Launching Station Generators	22	16-25	1	4.44	2.16	0.44	0.0505	0.21	0.75	4	12	8	6,336	0.03	0.02	0.00	0.00	0.00
ICC and CRG Generators	45	25-50	1	4.73	1.53	0.28	0.0506	0.28	0.75	24	12	4	38,880	0.20	0.07	0.01	0.00	0.01
Sentinel Generators	15	11-16	1	4.44	2.16	0.44	0.0505	0.21	0.75	12	12	1	1,620	0.01	0.00	0.00	0.00	0.00
LDS Generators	45	25-50	1	4.73	1.53	0.28	0.0506	0.28	0.75	24	12	6	58,320	0.30	0.10	0.02	0.00	0.02
Emission Factors are based on EPA Guidance Document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling — Compression-Ignition".														1.10	0.26	0.06	0.01	0.05

Alternative C	Equipment Assumptions			Emission Factors g/bhp					Load	Equipment Usage			Horsepower	Total Generator Emissions Tons				
									(fraction)	(hr/day)	(days)	(pieces)	Use					
Generator Emissions	**HP**	**HP Cat.**	**Tier**	NOx	CO	VOC	SOx	PM10						**NOx**	**CO**	**VOC**	**SOx**	**PM10**
EPP Generators	210	175-300	1	5.58	0.75	0.31	0.0455	0.20	0.75	24	12	4	181,440	1.12	0.15	0.06	0.01	0.04
Launching Station Generators	22	16-25	1	4.44	2.16	0.44	0.0505	0.21	0.75	4	12	16	12,672	0.06	0.03	0.01	0.00	0.00
ICC and CRG Generators	45	25-50	1	4.73	1.53	0.28	0.0506	0.28	0.75	24	12	8	77,760	0.41	0.13	0.02	0.00	0.02
Sentinel Generators	15	11-16	1	4.44	2.16	0.44	0.0505	0.21	0.75	12	12	2	3,240	0.02	0.01	0.00	0.00	0.00
LDS Generators	45	25-50	1	4.73	1.53	0.28	0.0506	0.28	0.75	24	12	6	58,320	0.30	0.10	0.02	0.00	0.02
Emission Factors are based on EPA Guidance Document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling — Compression-Ignition".														1.90	0.42	0.11	0.02	0.09

Table A.1-6
Emission Summary

Alternative	Emissions (tons)				
Proposed Action	**NOx**	**CO**	**VOC**	**SOx**	**PM10**
Clark County	0.18	0.02	0.01	0.00	0.33
Lincoln County	2.81	0.55	0.15	0.03	20.19
Total	2.99	0.58	0.15	0.03	20.52
Alternative B	1.67	0.34	0.09	0.02	10.34
Alternative C	2.74	0.54	0.14	0.03	15.65

Note: Clark County portion of Proposed Action is provided for General Conformity purposes.

APPENDIX A.2

GENERAL CONFORMITY ANALYSIS

1. INTRODUCTION

The USACE is in the process of evaluating the environmental effects of the Joint Red Flag '05 Exercise (proposed ADA activities). Based on the General Conformity requirements (40 CFR Part 93 et seq; November 1993), the USACE must make a determination of whether the proposed ADA activities "conform" with the State SIP. Conformity is defined as compliance with the SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards, and that the activities will not:

- Cause or contribute to any new violation of any standard;
- Increase the frequency or severity of any existing violation of any standard in any area; or
- Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

2. GENERAL CONFORMITY REQUIREMENTS

Under USEPA regulations (USEPA, 1993), a conformity analysis must be prepared only for criteria pollutants in non-attainment areas (see 58 FR 63214 - November 30, 1993) and maintenance areas. Moreover, according to 40 CFR Section 93.153 (Applicability of the General Conformity requirements), if the total direct and indirect emissions from the Proposed Action are below the General Conformity Rule "de minimis" emission thresholds the Proposed Action would be exempt from performing a comprehensive Air Quality Conformity Analysis, and would be considered to be in conformity with the SIP. Table A.2-1 provides the current General Conformity "de minimis" emission thresholds for the Las Vegas Valley nonattainment areas within Clark County. As indicated in Table 1, the de minimis emission threshold for PM10 is 70 tons per year due to the area being designated as serious nonattainment, and is 100 ton per year for CO by rule regardless of nonattainment designation, which is serious for this nonattainment area. The Las Vegas Valley has also recently been designated as a basic non-attainment for the 8-hour ozone NAAQS.[1]

Table A.2-1: General Conformity "de minimis" Emission Thresholds

Pollutant	Threshold (tons/year)
PM10	70
CO	100

Source: 40 CFR Part 93.153 (b) (1)

[1] The current General Conformity Rule requirements will change as of June 15, 2005. At that time the 8-hour ozone designation will become the applicable conformity standard (USEPA, 2003) for ozone conformity determinations. The Las Vegas Valley, which is in attainment of the 1-hour ozone standard, has been designated as a basic non-attainment area for the 8-hour ozone NAAQS, effective June 15, 2004, and will have until June 2009 to attain the standard (USEPA, 2004b). However, the Proposed Action will be completed before June 15, 2005, therefore, no ozone-based conformity requirements are triggered.

There are no nonattainment or maintenance areas within Lincoln County; therefore, the General Conformity requirements do not apply to Lincoln County, or to the emissions from the Proposed Action that would occur within Lincoln County.

Section 40 CFR Part 93.158 (a) states that if project emission levels exceed the "*de minimis*" emission rates listed in Part 93.153(b), and there is no applicable exemption, then a conformity analysis must be prepared. A conformity analysis would require that the Federal agency demonstrate (through computer modeling, purchasing offsets, or other avenues) that emissions associated with a proposed project are in compliance with the SIP. In addition, the conformity determination criteria (which are listed in Part 93.158), requires a public participation program. Requirements include a 30-day public comment period, notification in the daily newspaper in the area affected by the Proposed Action, and response to public comments.

3. PROJECT DESCRIPTION

The proposed ADA activities would involve the transport and set up and operation of both Patriot and Avenger ADA systems from NAFB to locations in Lincoln County, Nevada. The proposed ADA activities would not involve live artillery, and would be supported with mobile Sentinel radar systems. Additionally, a LSA will be maintained at a fixed location throughout the ADA activities. The Avenger batteries and the Sentinel radar system may move at will during the ADA activities, while the Patriot batteries could remain in a fixed location throughout the proposed ADA activities period or move several times during the ADA activities. Security perimeter patrolling would also occur during the proposed ADA activities. The aircraft operations that would be used as part of the ADA activities are part of and consistent with the existing operations within the Nellis Range Complex (NRC), so only the ground based units used in the proposed ADA activities have been considered new emission sources subject to the General Conformity determination.

4. PROPOSED ACTION SCHEDULE

The proposed ADA activities are scheduled to be completed within a two-week period in March, 2005.

5. PROPOSED ACTION EMISSIONS

Emission sources for PM10 can be distinguished as either tailpipe emissions from diesel on-road equipment and generators or road dust emissions from the on-road equipment travel on paved and unpaved roads. The CO emissions are tailpipe emissions from on-road equipment and generators. The assumptions used in quantifying the total emissions from these sources are described in the following paragraphs. However, the generator emissions are all assumed to occur in Lincoln County so for the General Conformity emissions calculations only the on-road vehicle emission within Clark County, including idle emissions assumed to occur during the initial staging need to be determined.

On-Road Vehicle Emissions

With regard to on-road vehicle emissions, the number of vehicles, weight class of the vehicles, number of trips, total vehicle miles traveled, and assumed vehicle speed on paved surfaces (no unpaved road

travel was assumed while in Clark County) were estimated for the proposed ADA activities. On-road mobile emissions were quantified using California Air Resources Board's (CARB's) EMFAC2002 model (CARB, 2004) to estimate vehicle tailpipe emission factors, and USEPA AP-42 (USEPA, 2004d) to estimate paved and unpaved road dust emissions. Refer to Appendix A.1 for other assumptions used in quantifying the emissions from the proposed ADA activities.

6. CONFORMITY STATUS

As listed in Table 2, the total PM10 and CO emissions generated from the proposed ADA activities within Clark County are much less than the General Conformity "*de minimis*" emission thresholds of 70 and 100 tons, respectively.

Table 2: Proposed Action Clark County Emissions (tons)

	PM10	CO
Emission Total	0.33	0.02
De Minimis Threshold	70	100
Exceedance of the De Minimis Threshold?	**NO**	**NO**

These emission totals are also well below 10% of the county-wide emissions specified in the CCDAQM air quality plans. The CCDAQM has estimated annual 1998 PM10 and 1996 CO emissions in the respective nonattainment areas to be 333,132.7 tons and 174,882.5 tons per year, respectively (CC, 2000, 2001). Therefore, the proposed ADA activities are assumed to conform with the SIP and no further analysis is required.

7. CONCLUSION

As demonstrated in this General Conformity Status Report, the Proposed Action's PM10 and CO emissions would be well below the current applicable General Conformity "de minimis" emission thresholds. As a result, the PM10 and CO emissions associated with the proposed ADA activities are exempt from the detailed conformity analysis, and would be considered to be in conformance with the SIP.

8. REFERENCES

CARB (California Air Resources Board). 2004. EMFAC2002. Website: http://www.arb.ca.gov/msei/msei.htm.

CC (Clark County). 2000. CO State Implementation Plan, Las Vegas Valley Nonattainment Area, Clark County, Nevada. Website: http://www.co.clark.nv.us/air_quality/CO_SIP.htm. Accessed December 2004.

CC (Clark County). 2001. PM10 State Implementation Plan for Clark County. Website: http://www.co.clark.nv.us/air_quality/CO_SIP.htm. Accessed December 2004.

USEPA (U.S. Environmental Protection Agency). 1993. 40 CFR Part 93, Subpart B. Determining Conformity of General Actions to State or Federal Implementation Plans.

_____. 2003. Proposed Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard. 40 CFR Part 51. Federal Register, Volume 68, No. 105. June 2, 2003.

_____. 2004b. Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard – Phase 1. Website: http://www.epa.gov/ozonedesignations/finalrule.pdf. Accessed May.

_____. 2004d. AP-42, Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*. Website: http://www.epa.gov/ttn/chief/ap42/index.html. Accessed December.

APPENDIX B.

UNITED STATES FISH AND WILDLIFE LIST OF SENSITIVE SPECIES FOR THE PROJECT AREA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, Nevada 89502
(775) 861-6300 ~ Fax: (775) 861-6301

TAKE PRIDE IN AMERICA

January 31, 2005
File No. 1-5-05-SP-427

Mrs. Gail Campos
Department of the Army
Corps of Engineers
Los Angeles District Office
Post Office Box 532711
Los Angeles, California 90053-2325

Dear Mrs. Campos:

Subject: Request for a Species List for the Joint Red Flag Exercise at the Nevada Test and Training Range, Lincoln County, Nevada

This responds to your letter received on December 10, 2004, requesting a species list for the general area you identified in your request where the training exercise is planned. The list of species identified below includes those federally listed species that may occur within the boundary you identified in your request:

- Bald eagle (*Haliaeetus leucocephalus*), Threatened, proposed for delisting
- White River springfish (*Crenichthys baileyi baileyi*), Endangered, critical habitat
- Hiko White River springfish (*Crenichthys baileyi grandis*), Endangered, critical habitat
- Pahranagat roundtail chub (*Gila robusta jordani*), Endangered
- Big Spring spinedace (*Lepidomeda mollispinis pratensis*), Threatened
- Southwest willow flycatcher (*Empidonax traillii extimus*), Endangered
- Western Yellow-billed cuckoo (*Coccyzus americanus*), Candidate
- Desert tortoise (*Gopherus agassizii*) (Mojave Population), Threatened

Further, you requested our determination whether the exercise and its location fall under purview of an existing programmatic biological opinion issued by the U.S. Fish and Wildlife Service (Service) to either the Bureau of Land Management (BLM) or Nellis Air Force Base (AFB). The existing BLM programmatic biological opinions do not include military exercises as part of the proposed action. The action area for the Nellis AFB biological opinion may not include the proposed impact areas associated with the exercise, and the anticipated effects may fall outside the scope of the proposed action for the consultation.

Mrs. Gail Campos File No. 1-5-05-SP-427

This list fulfills the requirement of the Service to provide information on listed species pursuant to section 7(c) of the Endangered Species Act of 1973, as amended (Act), for projects that are authorized, funded, or carried out by a Federal agency. Candidate species receive no legal protection under the Act, but could be proposed for listing in the near future. Consideration of these species during project planning may assist species conservation efforts and may prevent the need for future listing actions. Enclosure A provides a discussion of the responsibilities Federal agencies have under section 7 of the Act, and the conditions under which a biological assessment (BA) must be prepared by the lead Federal agency or its designated non-Federal representative. If it is determined by the responsible Federal agency that a listed or proposed species may be affected by the proposed project, then consultation should be initiated pursuant to 50 CFR § 402.14. Informal consultation may be utilized prior to a written request for formal consultation to exchange information and resolve conflicts with respect to listed species. If a BA is required, and it is not initiated within 90 days of the receipt of this letter, you should informally verify the accuracy of this list with our office. If, through informal consultation or development of a BA, it is determined that a proposed action is not likely to adversely affect the listed species, and the Service concurs in writing, then the consultation process is terminated and formal consultation is not required.

The Nevada Fish and Wildlife Office no longer provides species of concern lists. Most of these species for which we have concern, are also on the sensitive species list for Nevada maintained by the State of Nevada's Natural Heritage Program (Heritage). Instead of maintaining our own list, we are adopting Heritage's sensitive species list and partnering with them to provide distribution data and information on the conservation needs for sensitive species to agencies or project proponents. The mission of Heritage is to continually evaluate the conservation priorities of native plants, animals, and their habitats, particularly those most vulnerable to extinction or in serious decline. Consideration of these sensitive species and exploring management alternatives early in the planning process can provide long-term conservation benefits and avoid future conflicts.

For a list of sensitive species by county, visit Heritage's website at www.heritage.nv.gov. For a specific list of sensitive species that may occur in the project area, you can obtain a data request form from the website or by contacting Heritage at 1550 East College Parkway, Suite 137, Carson City, NV 89706, 775-687-4245. Please indicate on the form that your request is being obtained as part of your coordination with the Service under the Act. During your project analysis, if you obtain new information or data for any Nevada sensitive species, we request that you provide the information to Heritage at the above address. Furthermore, certain species of fish and wildlife are classified as protected by the State of Nevada (see http://www.leg.state.nv.us/NAC/NAC-503.html). Before a person can hunt, take, or possess any parts of wildlife species classified as protected, they must first obtain the appropriate license, permit, or written authorization from The Nevada Department of Wildlife (visit http://www.ndow.org or call 702-486-5127).

Mrs. Gail Campos File No. 1-5-05-SP-427

Based on the Service's conservation responsibilities and management authority for migratory birds under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 *et. seq.*), we are concerned about potential impacts the proposed project may have on migratory birds in the area. Given these concerns, we recommend that any land clearing or other surface disturbance associated with proposed actions within the project area be timed to avoid potential destruction of bird nests or young, or birds that breed in the area. Such destruction may be in violation of the MBTA. Under the MBTA, nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. Therefore, we recommend land clearing be conducted outside the avian breeding season. If this is not feasible, we recommend a qualified biologist survey the area prior to land clearing. If nests are located, or if other evidence of nesting (*i.e.*, mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) should be delineated and the entire area avoided to prevent destruction or disturbance to nests until they are no longer active.

Please reference File No. 1-5-05-SP-427 in future correspondence concerning this species list. If you have any further questions regarding this correspondence or require additional information, please contact Michael Burroughs in our Southern Nevada Field Office at (702) 515-5230.

Sincerely,

Cynthia T. Martinez

for Robert D. Williams
Field Supervisor

Enclosure

cc:
Field Manager, Bureau of Land Management, Ely Field Office, Ely, Nevada
Biologist, Department of the Air Force, Nellis Air Force Base, Nevada

ENCLOSURE A

FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7 (a) and (c) OF THE ENDANGERED SPECIES ACT

SECTION 7 (a); Consultation/Conference

Requires:

1) Federal agencies to utilize their authorities to carry out programs to conserve **endangered and threatened species**;

2) Consultation with the Fish and Wildlife Service (Service) when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after determining the action may affect a listed species or critical habitat;

3) Conference with the Service when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat.

SECTION 7 (c): Biological Assessment - Major Construction Activity 1/

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for major construction activities. The BA analyzes the effects of the action on listed and proposed species. The process begins with a Federal agency requesting from the Service a list of proposed and listed threatened and endangered species. The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the list, the accuracy of the species list should be informally verified with the Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may proceed; however, no construction may begin.

We recommend the following for inclusion in the BA:

1. An onsite inspection of the area affected by the proposal which may include a detailed survey of the area to determine if the species or suitable habitat are present

2. A review of literature and scientific data to determine species distribution, habitat needs, and other biological requirements.

3. Interviews with experts, including those within the Service, State conservation departments, universities, and others who may have data not yet published in scientific literature.

4. An analysis of the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat.

5. An analysis of alternative actions considered.

6. Documentation of study results, including a discussion of study methods used, any problems encountered, and other relevant information.

7. Conclusion as to whether or not a listed or proposed species will be affected.

Upon completion, the BA should be forwarded to our office with a request for consultation, if required.

1 A construction project (or other major undertaking having similar physical impacts) is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332 (2) C).

APPENDIX C.

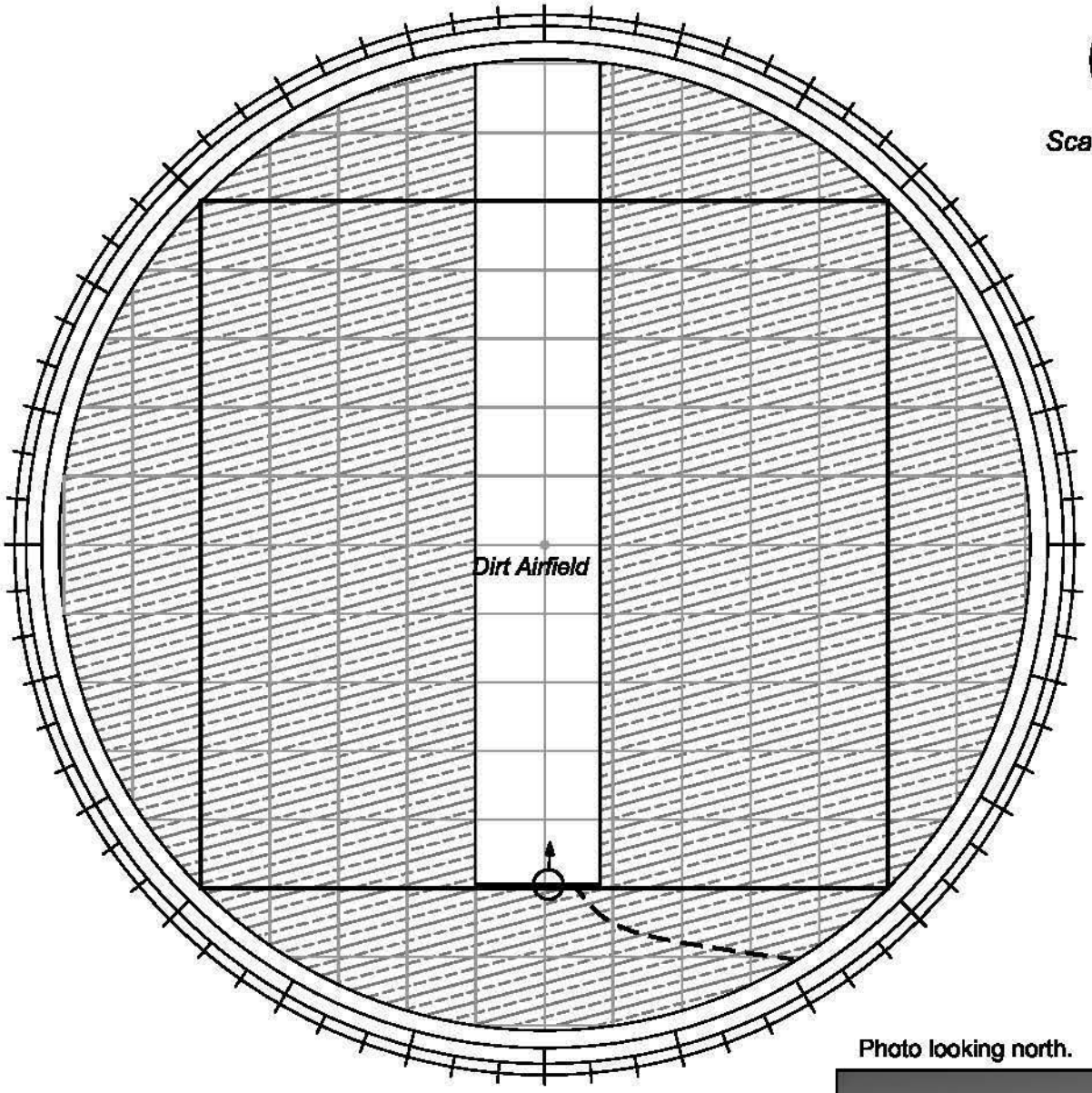
BIOLOGICAL RESOURCES

C.1 Vegetation Maps

C.2 Plant List

APPENDIX C.1

VEGETATION MAPS



Scale: 1mm = 5m

ADA Site Area

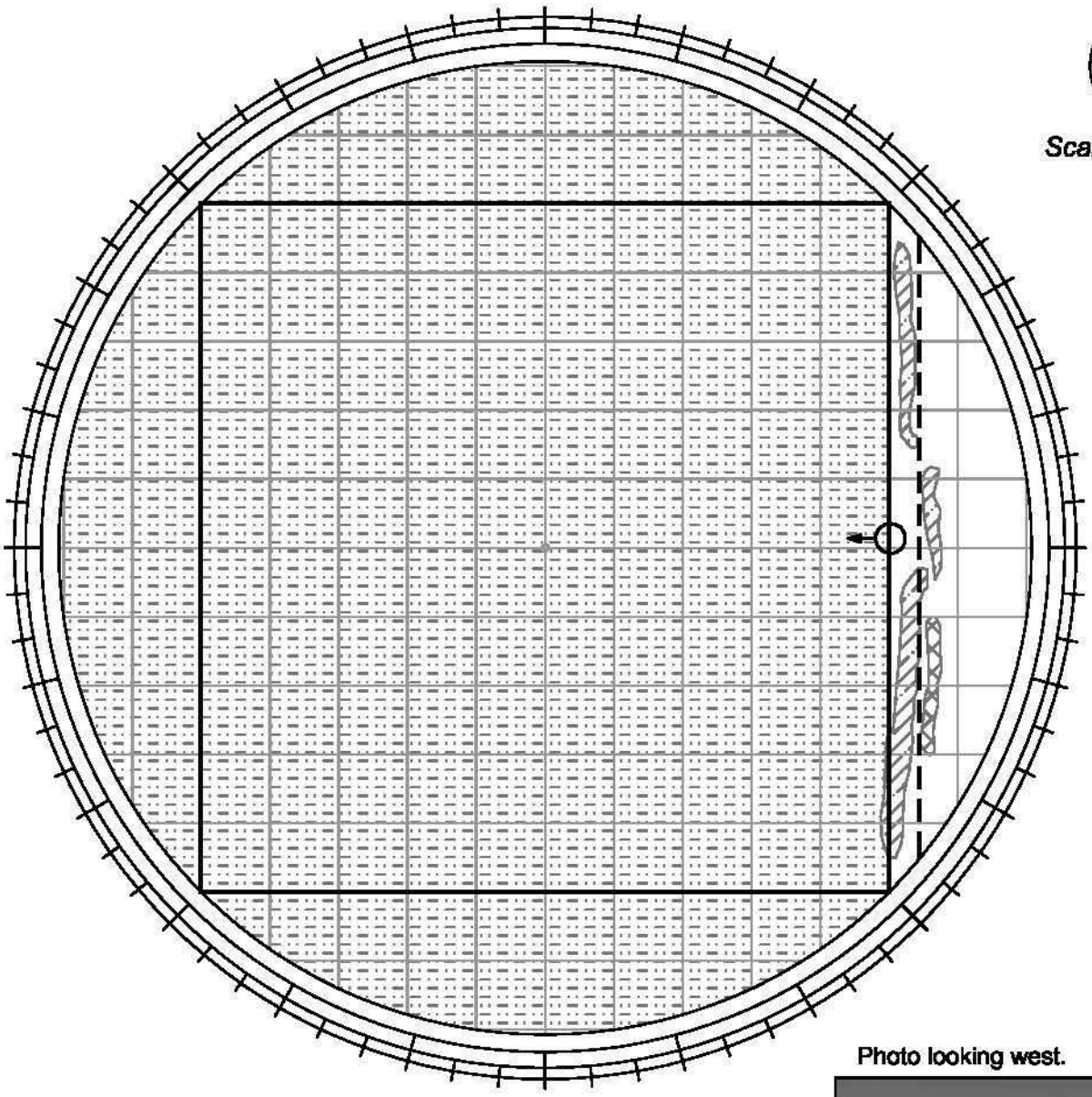
Dirt Road

Mojave scrub

Photo Location/Direction

Photo looking north.

ADA Site	Location	Land Type	Land Cover Characteristics
LSA Logistic Support Area	Alamo Airport ca. 1 mile west of the community of Alamo	Barren, dirt airfield	Site would be located on the improved dirt airfield. Existing runway is approximately 1 mile long and 0.1 mile in width. Surrounding habitat is characterized as Mojave scrub dominated by creosote bush in association with Mormon tea, Joshua tree, snakeweed, and banana yucca.



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ADA Site Area

Dirt Road

Playa

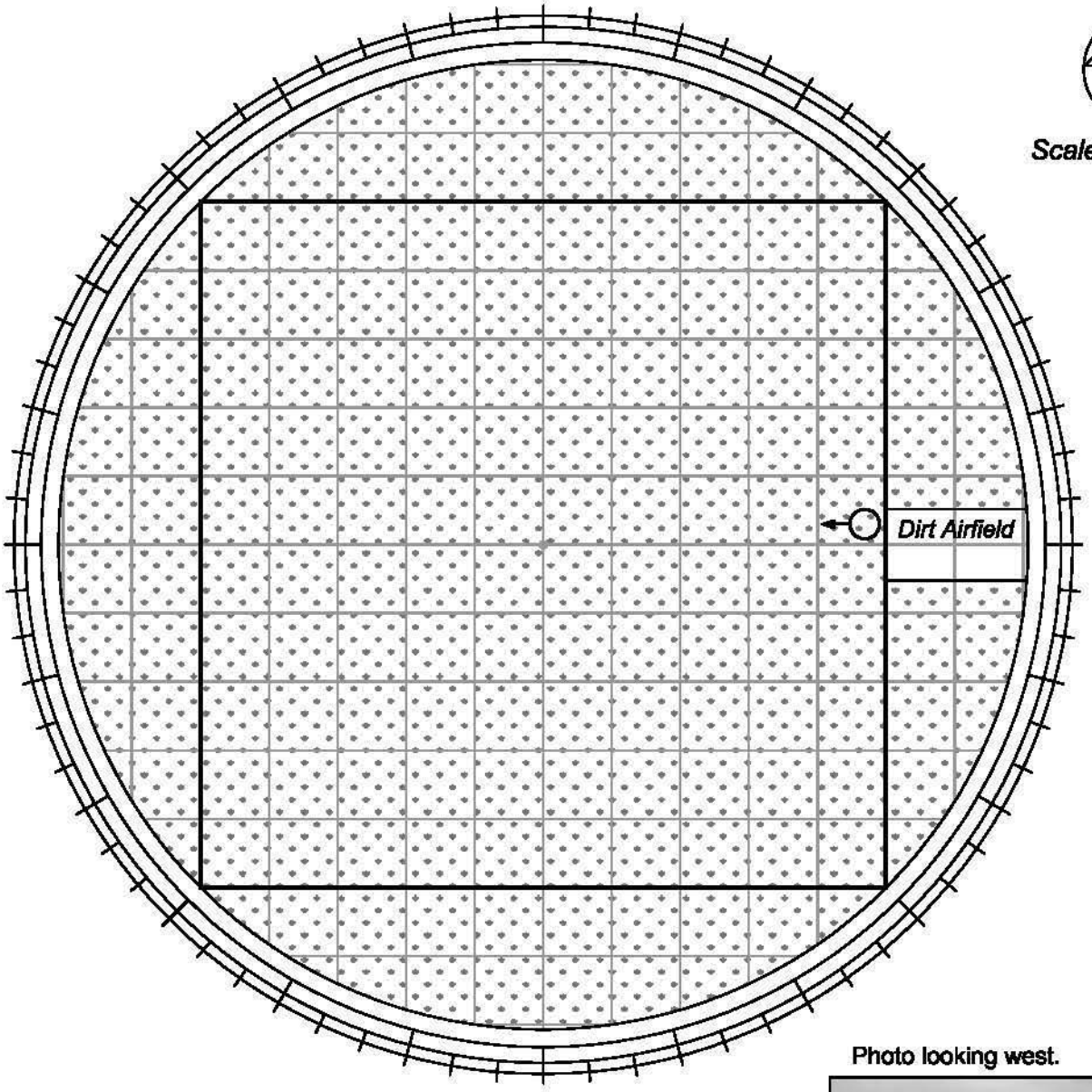
Greasewood/Hopsage

Disturbed/Exotics

Photo Location/Direction

Photo looking west.

ADA Site	Location	Land Type	Land Cover Characteristics
PAT 1	Delmar Valley near Delmar Lake	Playa	Barren. Vegetation limited to isolated populations of greasewood and hopsage located near the dirt access road. Invasive species such as Russian thistle and halogeton are present on portions of the site but occur primarily on disturbed road edges.



Scale: 1mm = 10m

ADA Site Area

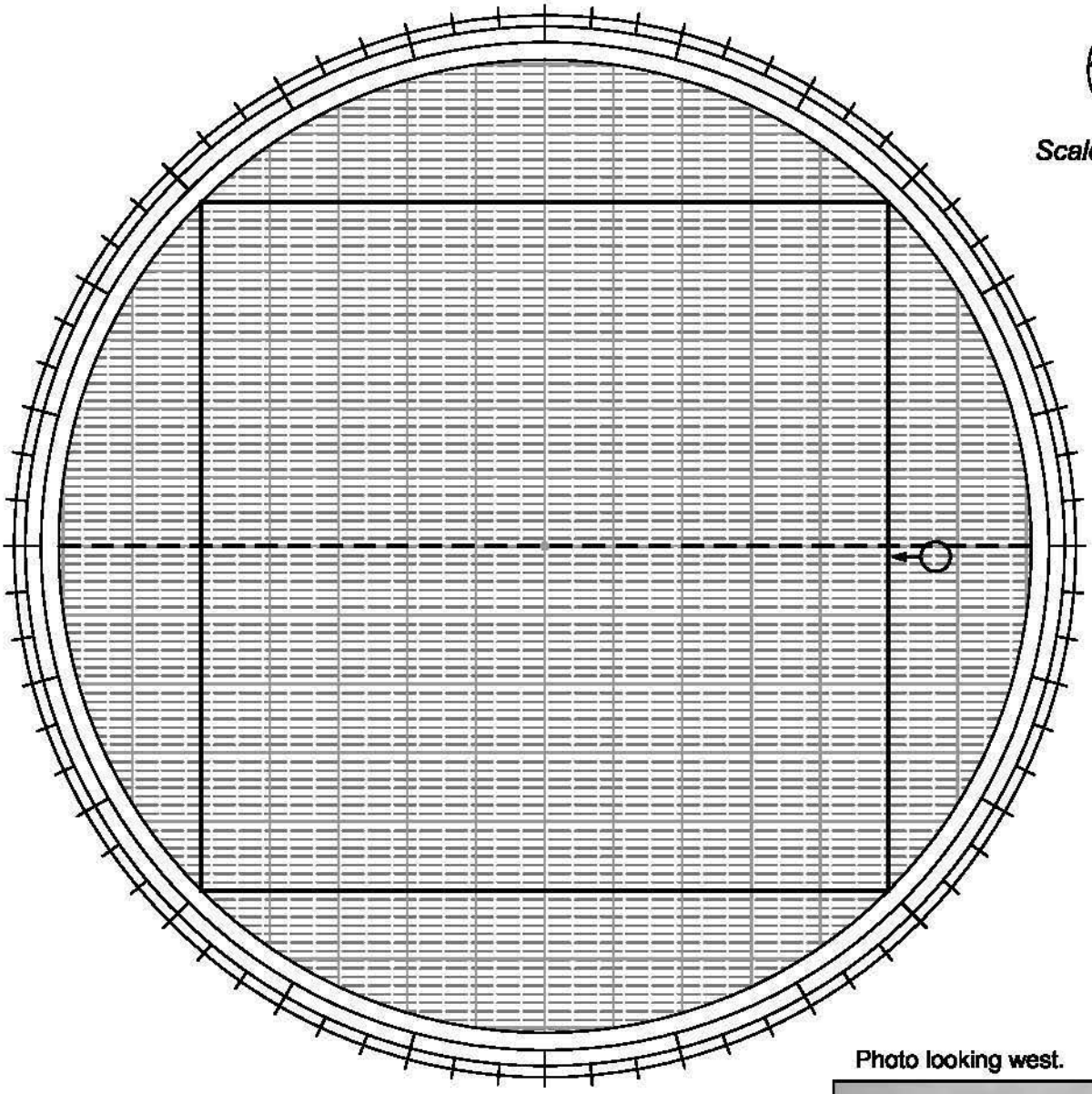
Dirt Road

Disturbed Grassland

Photo Location/Direction

Photo looking west.

ADA Site	Location	Land Type	Land Cover Characteristics
PAT 3 / CCC	Delmar Valley ca. 1 mile south of Highway 93	Disturbed grassland, dirt airfield	Located on the south end of a dirt airfield. Activities would occur within the fenced section of the site. Adjacent habitat appears to be subject to periodic mowing and grazing. Dominant species include red three-awn, desert needle grass, and rubber rabbitbrush. Indian rice grass, big galletta grass, and Russian thistle common.



Scale: 1mm = 10m

ADA Site Area

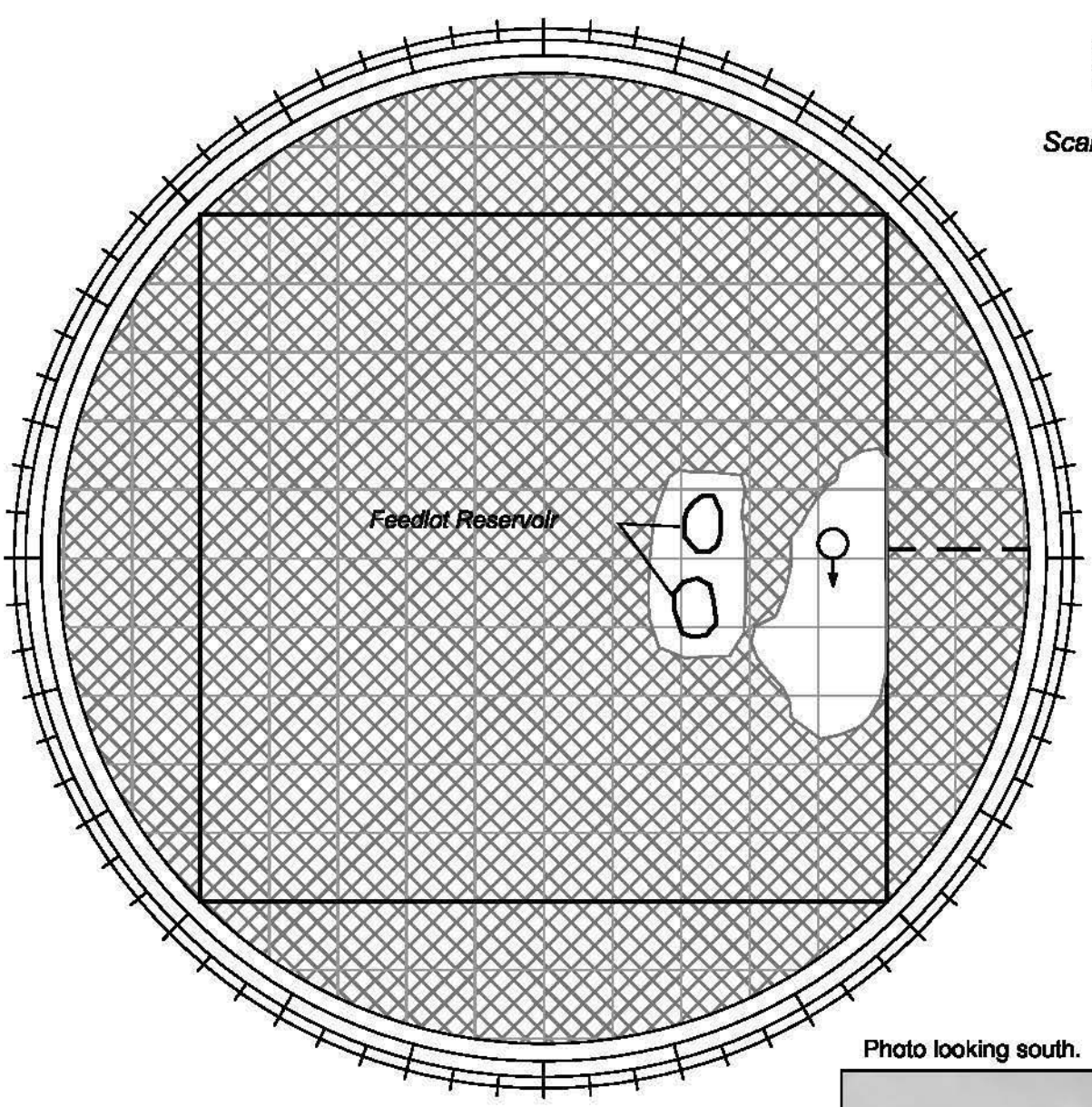
Dirt Road

Blackbrush

Photo Location/Direction

Photo looking west.

ADA Site	Location	Land Type	Land Cover Characteristics
PAT 4	Area west of Pahroc Summit Pass	Blackbrush	Scrubland dominated by blackbrush, white bursage, four-wing saltbush and range ratany. No recent evidence of grazing. Joshua tree, creosote bush, and elements of big sage brush also present. Beavertail, silver cholla, and old man cactus present. Small population of basket bush located on southern section.



Scale: 1mm = 10m

ADA Site Area

Dirt Road

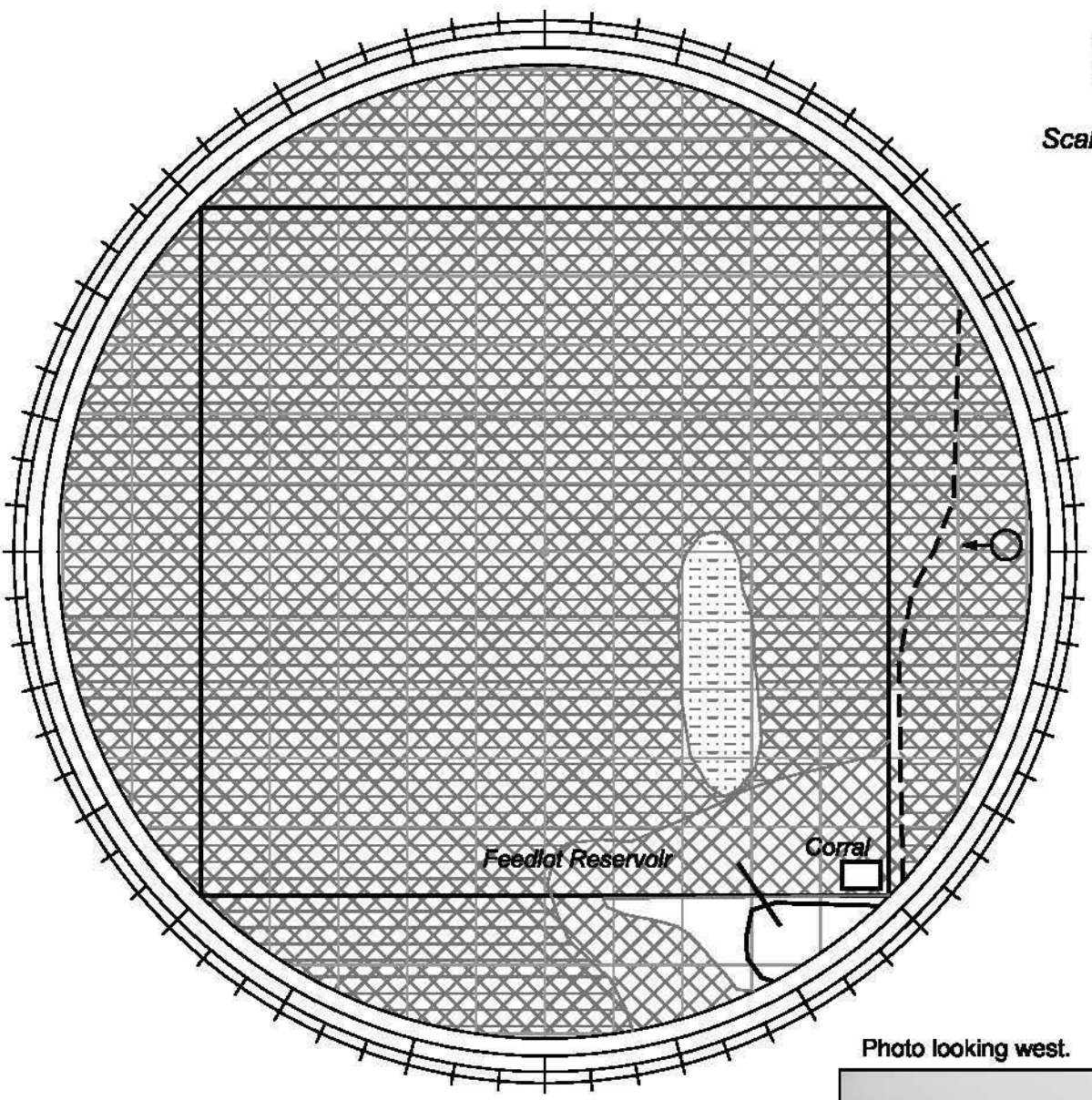
Disturbed Grassland

Barren

Photo Location/Direction

Photo looking south.

ADA Site	Location	Land Type	Land Cover Characteristics
PAT 101	Delamar Valley ca. 8 miles north of Delamar Lake	Disturbed, barren feedlot area	Area located near feedlot reservoir. Many areas lack vegetation and consist of hard packed soils. Russian thistle dominates vegetative component at the site.



Scale: 1mm = 10m

ADA Site Area

Dirt Road

Playa

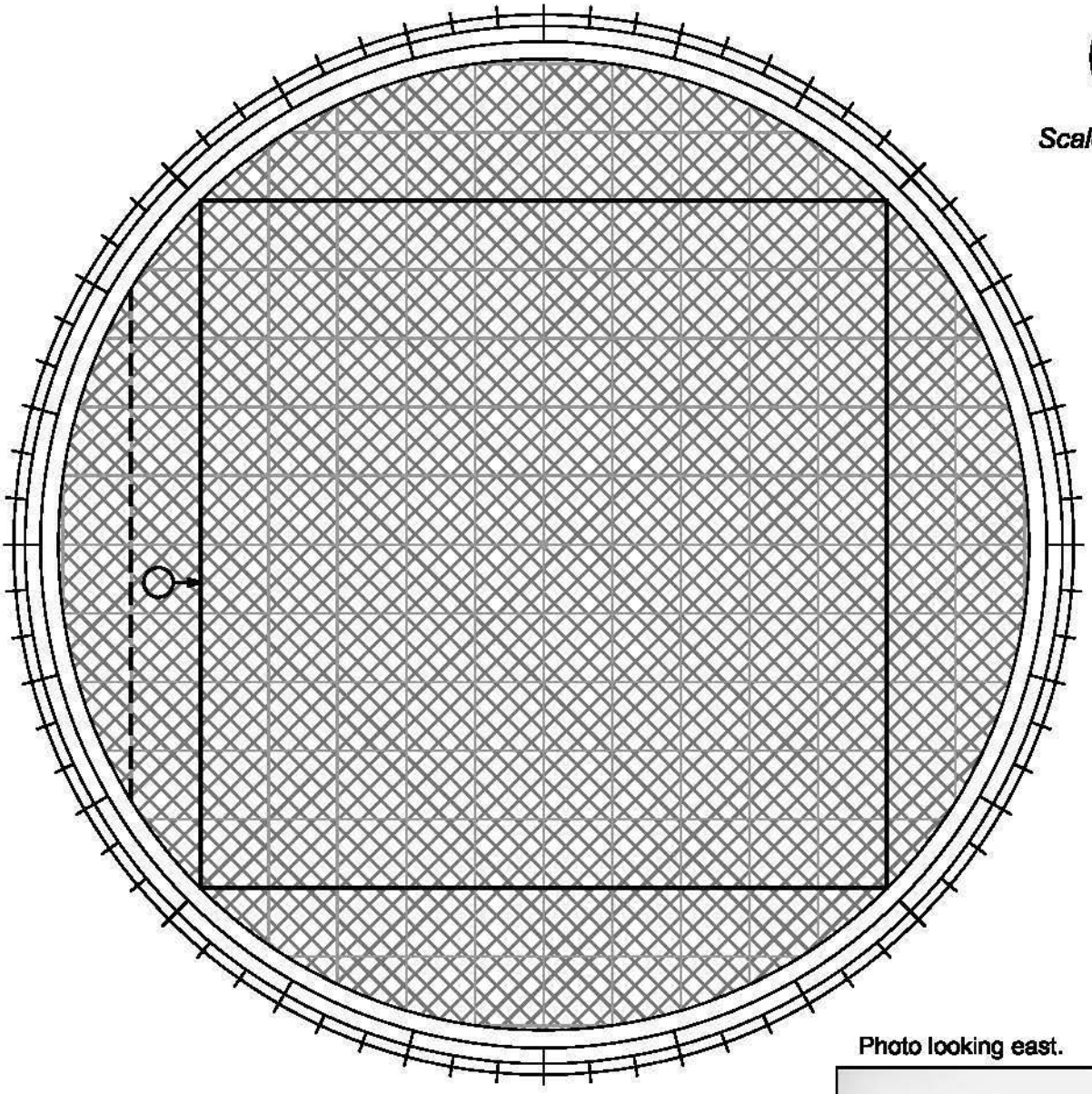
Disturbed Rabbitbush

Disturbed/Exotics

Photo Location/Direction

Photo looking west.

ADA Site	Location	Land Type	Land Cover Characteristics
PAT 102	Delamar Valley ca. 3 miles south of Highway 93	Disturbed, rabbitbrush and playa	Area located near feedlot reservoir. Many areas lack vegetation. Dominant vegetation includes disturbed rabbitbrush community, budsage, Indian rice grass, and snakeweed. Russian thistle common. Joshua trees and winterfat present to a limited extent.



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ADA Site Area

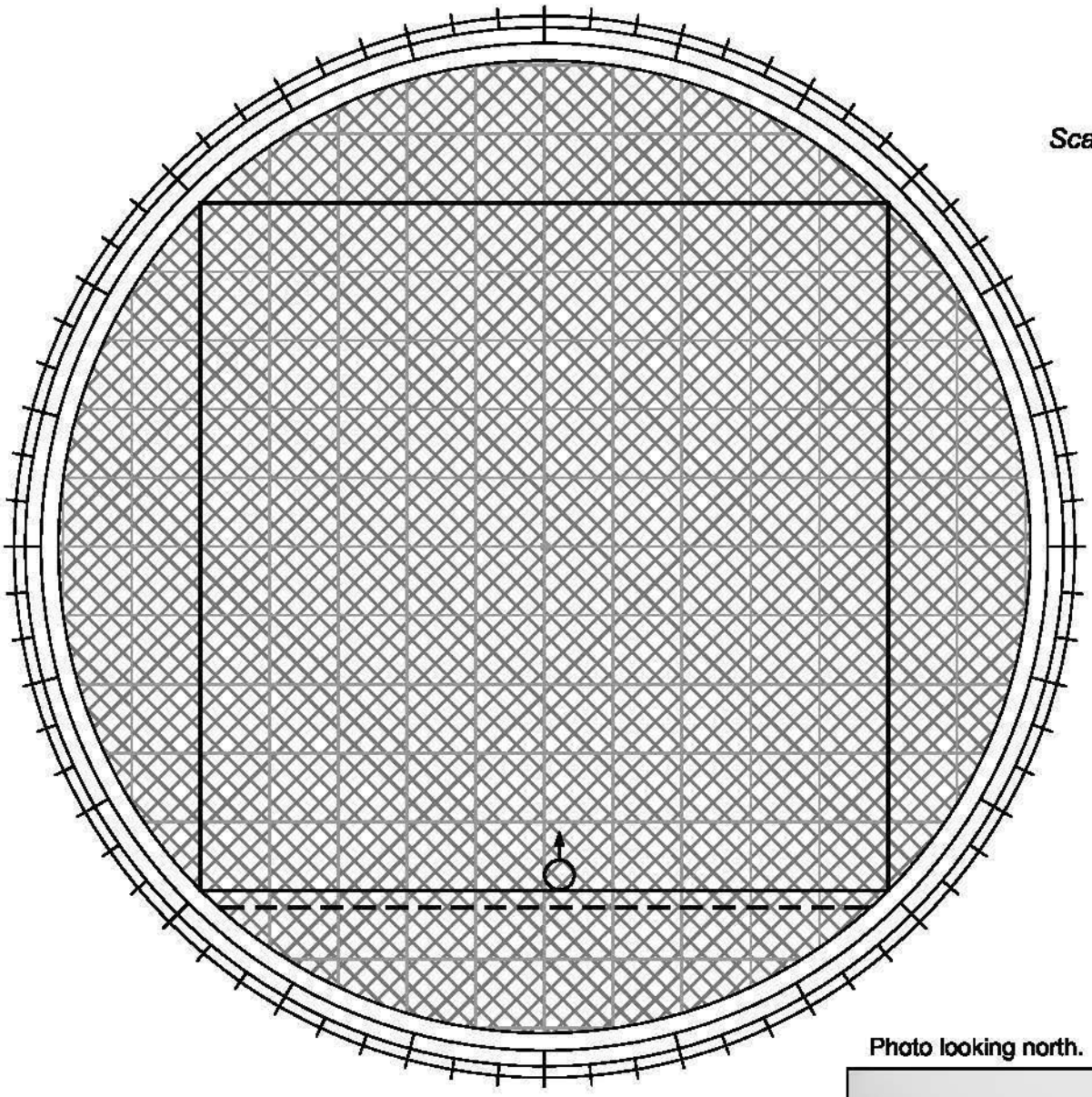
Dirt Road

Disturbed Grassland

Photo Location/Direction

Photo looking east.

ADA Site	Location	Land Type	Land Cover Characteristics
PAT 103	Dry Lake Valley ca. 9 miles north of Highway 93	Disturbed Habitat	Evidence of historic grazing. Site dominated by Russian thistle, rabbitbrush, and cheatgrass. Other species include mallow, Indian rice grass, and big galletta.



Scale: 1mm = 10m

ADA Site Area

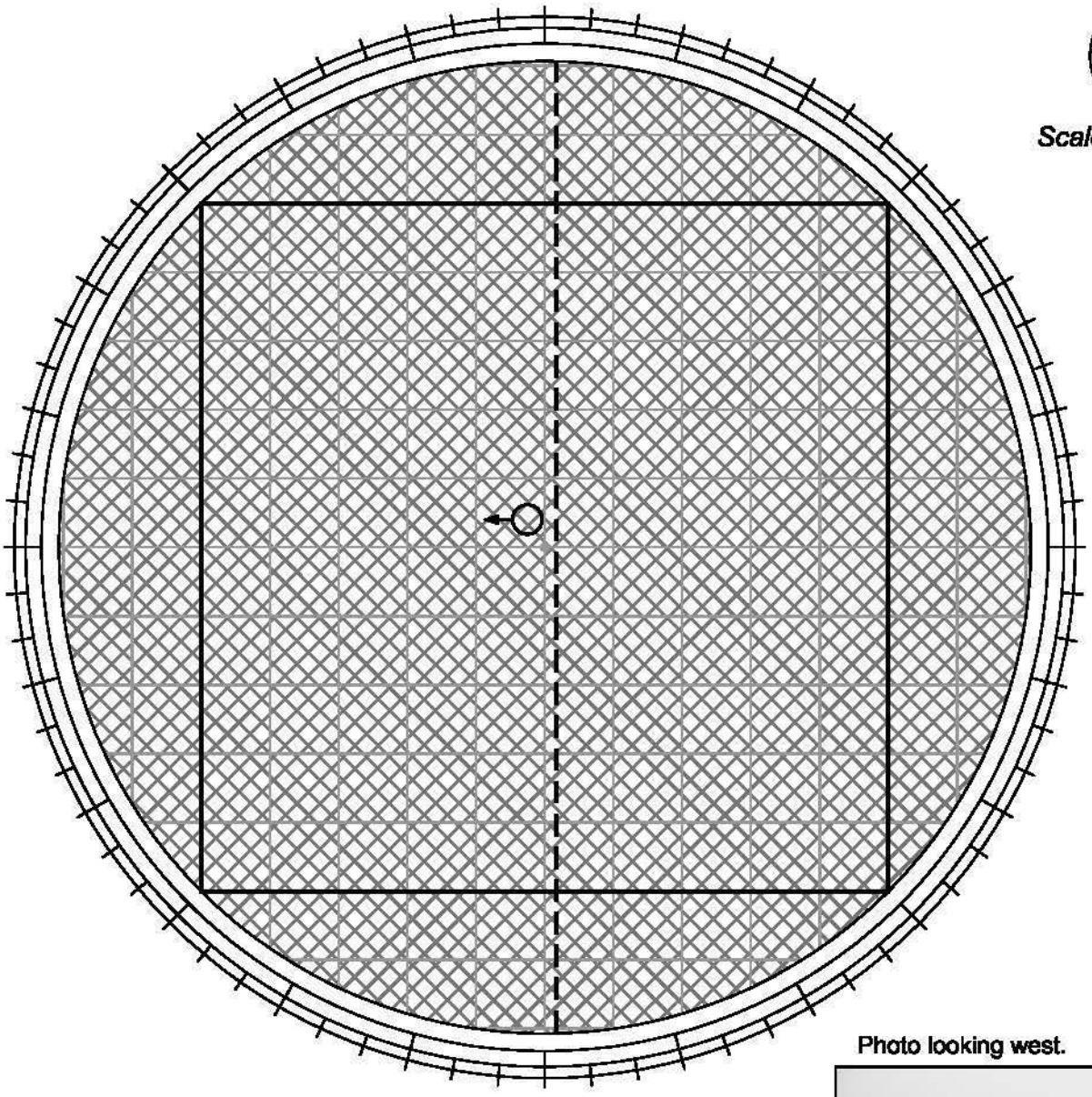
Dirt Road

Disturbed Grassland

Photo Location/Direction

Photo looking north.

ADA Site	Location	Land Type	Land Cover Characteristics
PAT 104	Dry Lake Valley ca. 20 miles north of Highway 93	Disturbed grassland	Disturbed grassland with heavy component of Russian thistle. Indian rice grass and big galletta are also present.



Scale: 1mm = 10m

ADA Site Area

Dirt Road

Disturbed Grassland

Photo Location/Direction

Photo looking west.

ADA Site	Location	Land Type	Land Cover Characteristics
PAT 104A	Dry Lake Valley ca. 20 miles north of Highway 93	Disturbed grassland	Grassland dominated by cheatgrass, Indian rice grass, and big galletta. Russian thistle common. Other species includes snakeweed, Mormon tea, and winterfat.

APPENDIX C.2

PLANT LIST

Appendix C-2 Plant Species Observed In Proposed ADA Activity Area

Scientific Name	Common Name	Non-Native
GRASSES/FORBES		
Acamptopappus shockleyi	Goldenhead	
Ambrosia dumosa	White bursage	
Astragalus lentiginosus	Freckled milk vetch	
Atriplex canescens	Four-wing saltbush	
Aristada glauca	Red three-awn	
Bromus tectorum	Downey brome	X
Bromus tectorum	Cheatgrass	X
Bromus madritensis ssp. rubens	Red brome	X
Camaesyce albomarginata	Rattlesnake weed	
Chorizanthe rigida	Spiny chroizanthe	
Coleogyne ramosissima	Blackbrush	
Descurainia sp.	Tansy mustard	X
Distichlis spicata	Salt grass	
Eriogonum delexum	Skeleton weed	
Eriogonum fasciculatum	Mojave buckwheat	
Eriogonum inflatum	Desert trumpet	
Erioneuron pulchellum	Fluff grass	
Gaura coccinea	Scarlet gaura	
Halogeton glomeratus	Halogeton	X
Hilaria rigida	Big galletta grass	
Krameria erecta	Range ratnay	
Langloisia setosissima	Bristly gilia	
Linum perenne	Blue flax	
Menodora spinescens	Spiny menodora	
Mimulus bigelovii	Bigelow monkey flower	
Oryzopsis hymenoides	Indian rice grass	
Penstemon utahensis	Utah penstemon	
Phacelia calthifolia	Notch-leaf phacelia	
Psathyrotes ramosissima	Desert velvet	
Salsola tragus	Russian thistle	X
Sphaeralcea ambigua	Apricot mallow	
Stanleya pinnata	Princes plume	
Stipa specieosum	Desert needle grass	
Xylorhiza tortifolia	Mojave aster	
CACTUS/YUCCA		
Echinocerus engelmannii	Strawberry hedgehog	
Opuntia basilaris	Beavertail	
Opuntia echinocarpa	Silver Cholla	
Opuntia erinacea	Old man cactus	
Opuntia phaeacantha	Prickly pear cactus	
Yucca baccata	Banana yucca	
Yucca brevifolia	Joshua tree	
SHRUBS		
Artimesia nova	Black sage	
Artimesia tridentata tridentata	Big sagebrush	
Artimesia spinescens	Budsage	
Atriplex canescens	Four-wing saltbush	
Chrysothamnu viscidiflorus	Sticky rabbitbrush	
Chrysothamnus nauseosus	Rubber rabbitbrush	
Coleogyne ramosissima	Blackbrush	
Ephedra sp.	Mormon tea	

Scientific Name	Common Name	Non-Native
Grayia spinosa	Spiny hopsage	
Gutierrezia sarothrae	Broom snakeweed	
Hymenoclea salsola	Cheese bush	
Krascheninnikovia lanata	Winterfat	
Larrea tridentata	Creosote bush	
Purshia mexicana	Cliff rose	
Rhus trilobata	Basket bush	
Salvia dorii	Purple sage	
Sarcobatus vermiculatus	Greasewood	

APPENDIX D.

BIOLOGICAL ASSESSMENT

BIOLOGICAL ASSESSMENT

For the
Joint Red Flag '05 ADA Activities
Nellis Air Force Base

Nellis AFB Testing and Training Range
Lincoln Counties, Nevada

Prepared by:

US Army Corps of Engineers, Los Angeles District
Regional Planning Section
Planning Division, CESPL-PD-RL
915 Wilshire Boulevard
Los Angeles, CA 90017

Prepared For:

FORSCOM
U.S. Army Forces Command
Fort McPherson, Georgia

February 23, 2005

Introduction

Section 7 of the Endangered Species Act (ESA) of 1973, as amended requires Federal agencies, in consultation with the US Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) insure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. The purpose of a biological assessment (BA) is to evaluate the potential effects of the proposed action on the listed and proposed species and designated and proposed critical habitat and determine whether any such species or habitat are likely to be adversely affected by the proposed action (Federal Register 1986).

The purpose of this BA is to review the proposed Air Defense Artillery (ADA) Joint Red Flag '05 Exercise (Proposed ADA activities) in sufficient detail to determine to what extent this proposed action may affect any listed, proposed, and candidate threatened or endangered wildlife, fish, and plant species of record.

Location

The proposed ADA activities would be conducted on Bureau of Land Management (BLM) lands under the Military Operating Areas (MOA) controlled by Nellis Air Force Base (NAFB) in Lincoln County Nevada. All of the proposed ADA sites, including the Logistic Support Area (LSA) would be located in an area encompassing approximately 2.5 million acres within Lincoln County, Nevada (Figure 1), which is at the boundary of the northern Mojave Desert and the southern Great Basin. The LSA site is located on an airfield located approximately 1 mile west of the town of Alamo, NV, on the west side of US highway 93.

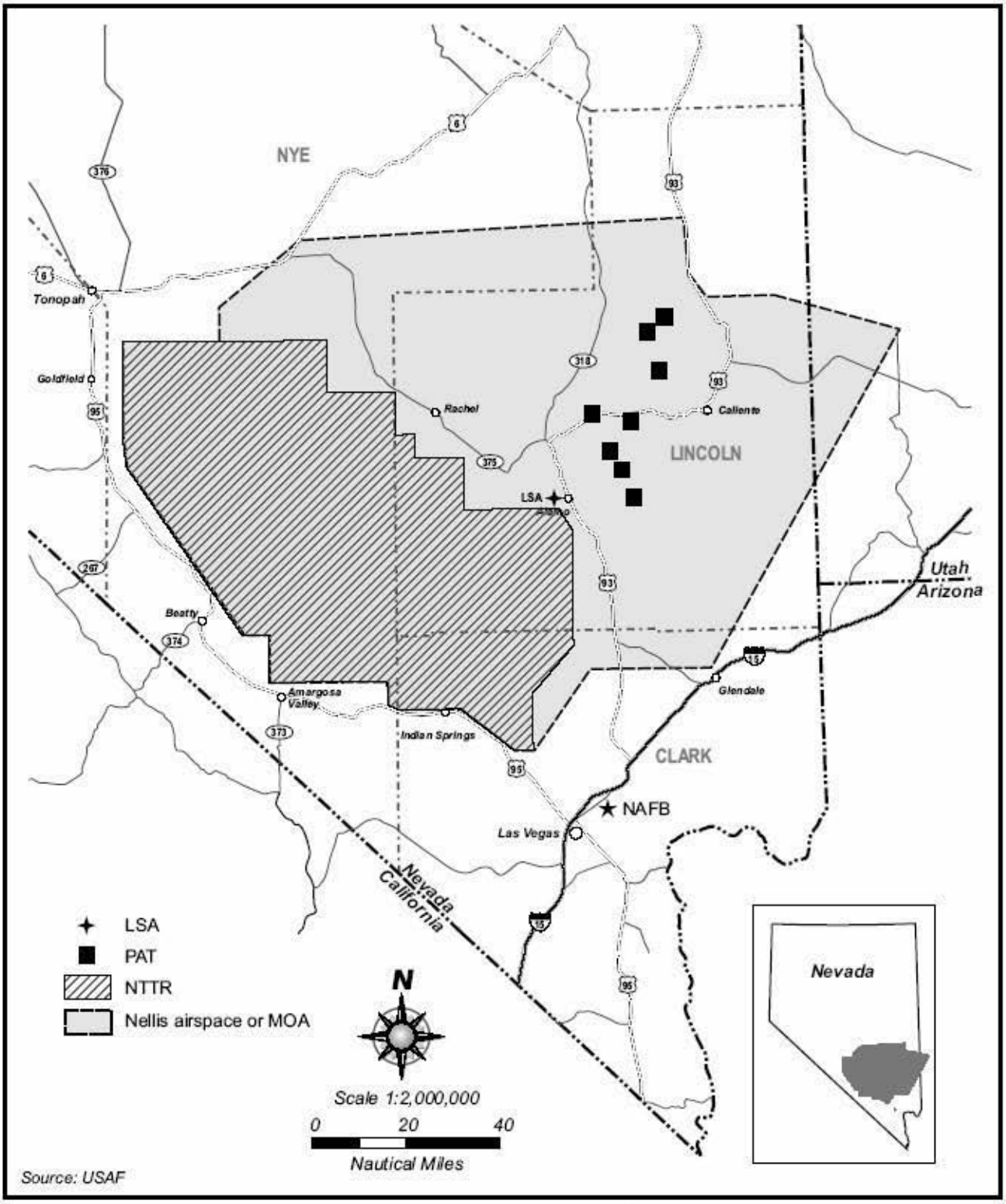
Project Description

Project Summary and Background

Large-scale, multi-force, military training exercises regularly occur at Nellis Air Force Base (NAFB) and the Nevada Test and Training Range (NTTR). These exercises, known as Red Flag exercises, provide for realistic joint training for Multi-service and North Atlantic Treaty Organization (NATO) forces. These exercises routinely consist of air-to-air combat training that is conducted within the airspace over the NTTR. In March 2005, the Red Flag Exercises would introduce ground-based ADA and radar unit operations on BLM managed public lands. This would include Army Patriot and Avenger Batteries and Sentinel Radar Systems. The Agencies involved include the U.S. Air Force (USAF) and U.S. Army (Army).

Purpose and Need for the Proposed Action

The purpose of the proposed ADA activities is to provide high quality realistic training for Army units. This involves conducting an overall exercise involving ground-to-air, air-to-air, and air-to-ground combat scenarios; in a combined multi-service arms setting that realistically replicates probable combat conditions. These combined elements provide a simulated combat environment to allow training and evaluation of multi-service commanders, forces, and equipment.



Regional Map with ADA Locations

Joint Red Flag '05 ADA Activities

Figure 1

Description of the Proposed Action

In order to simulate a combat situation, the exercise participants would be divided into allied, or "Blue Forces" (BLUFOR), and adversary, or "Red Forces" (REDFOR). Both opposing forces would deploy aircraft during the proposed ADA activities. During the proposed ADA activities, the allied side would deploy ground-based missile systems at a combination of pre-selected sites and areas of opportunity on BLM-approved dirt access roads. The opposing forces would then try to identify, target, and electronically (radar) defeat the other's systems and tactics. No live firing from ground or air would be included in the proposed ADA activities.

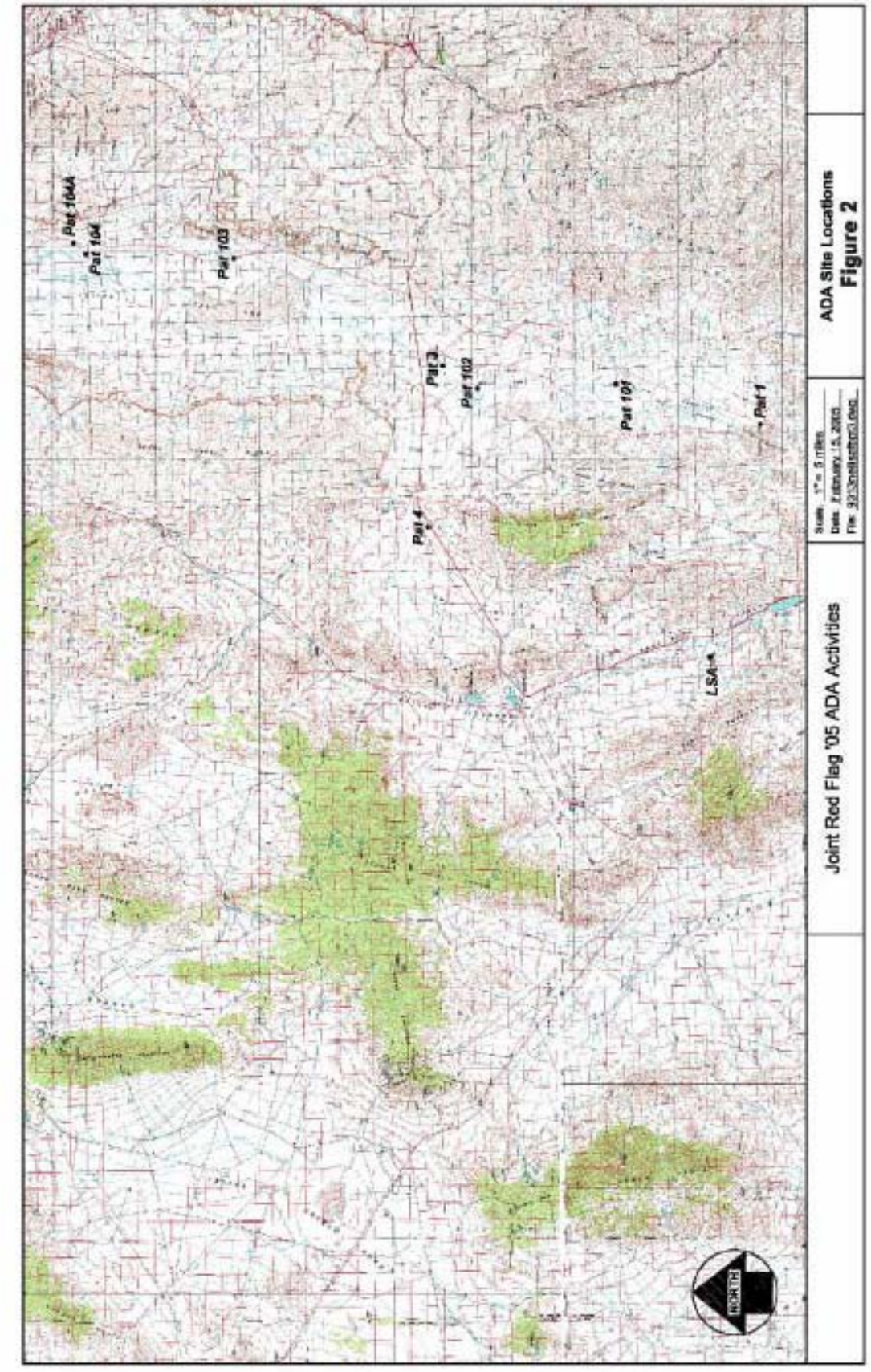
Allied ground-based units (e.g., Patriot, Avenger, and Sentinel Radar Systems) would be deployed and would provide ground-based air and missile defense in conjunction with BLUFOR aircraft. Approximately 200 rubber tire vehicles and 500 personnel would deploy to 14 possible field sites in the NTTR. Radar or similar systems used for tracking of training missions would be used to simulate an attack. Simulated enemy radar is normally authorized using a communication site during an exercise of this type. No ordinance (e.g., explosives) would be expended during the proposed ADA activities and only simulated weapons (electronic lock) would be used.

During the proposed ADA activities, REDFOR strike aircraft would fly from the west toward the east range and attempt to intercept and neutralize BLUFOR aircraft and ground-based ADA units. The ground-based units would, in turn, exercise their ability to detect and defeat the incoming REDFOR aircraft. In addition to the BLUFOR and REDFOR units, the proposed ADA activities would also contain a neutral force composed of personnel monitoring the proposed ADA activities. Those personnel would control the proposed ADA activities and monitor its progress, test new equipment or procedures, ensure safety, and ensure compliance with environmental restrictions.

The proposed ADA activities would be conducted during a four-week period, which includes preparation and post-proposed ADA activities critique. The simulated combat portion of the proposed ADA activities is scheduled to occur during a two-week period from March 17 to April 02, 2005. The ground-based systems would deploy from NAFB to set up sites on or about 15 March 2005, and return from the proposed ADA activities area from April 02 thru 04, 2005 back to the NAFB staging area for redeployment to Fort Bliss.

Site selected for use by ground-based forces follow standard operating procedures (SOP) to ensure compliance with environmental requirements for avoidance of adverse impacts to sensitive resources.

During the proposed ADA activities, ground-based field units would deploy into five area types: Patriot, Sentinel and Avenger Mobile/transient, the Command and Control Center (CCC) and a LSA. Nine sites (figure 2) have been selected by multidisciplinary environmental teams for possible use during the proposed ADA activities. These include eight Patriot sites, the CCC, and one LSA site. Although eight Patriot sites have been identified for possible use, only two Patriot sites (i.e., two Patriot batteries) would be utilized at any given time during the exercise. The CCC site, located at the Patriot 3 site, would remain in place during the entire exercise. Depending on mission requirements, this site could also support a Patriot battery. This allows for flexibility in responding to the tactical scenario.


Pat 104A
Pat 104
Pat 103
Pat 3
Pat 102
Pat 101
Pat 1
Pat 4
LSA-1
NORTH
Joint Red Flag '05 ADA Activities
ADA Site Locations
Figure 2

The Avenger and Sentinel mobile/transient units would be located on or adjacent (within 50 meters or 164 feet) to existing dirt access roads located at sites of opportunity as needed during the exercise. The Avenger and Sentinel sites utilized during the proposed ADA activities will be selected based on SOPs. The SOPs were designed to minimize potential impacts to sensitive environmental and cultural resources.

Patriot Battery Unit

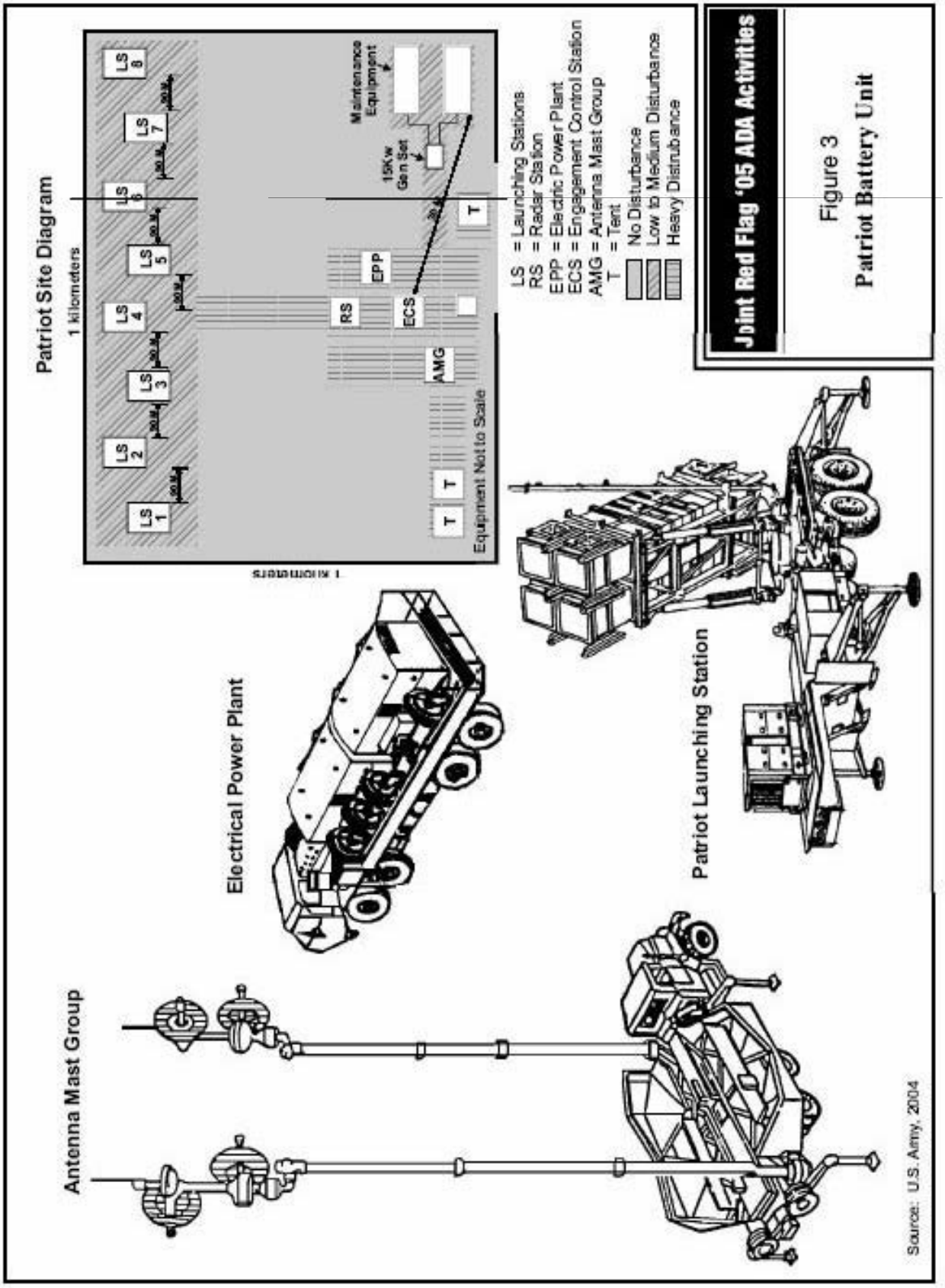
Eight Patriot ADA sites could be utilized during the proposed ADA activities. Each Patriot ADA site occupies an area of approximately one square kilometer, km^2 (approximately 250 acres). For the proposed ADA activities, the U.S. Army intends to locate most if not all of the Patriot systems within a one-quarter km^2 (approximately 60 acres) and would support approximately 32 vehicles and 85 soldiers. Typical equipment at each site would include six to eight launchers, a radar station, power plant/generator, control station, antenna masts, and other support equipment. Grounding rods may be used during the proposed ADA activities and would be removed at the completion of the exercise. Figure 3 shows a typical Patriot Battery layout, types of equipment that would be located on each site, and areas of potential disturbance. Each Patriot site would billet the 85 soldiers, requiring up to three tents, a mobile field kitchen, shower, and toilet facilities. Most of these facilities would be located just inside the entry point near the perimeter of the site.

The perimeter of each of the proposed sites would be established and delineated with exclusion tape or snow fencing prior to emplacement to prevent the disturbance of adjacent habitat. No razor or concertina wire would be used. The entry control point would be located next to the closest access road and clearly identified with flagging or signage. Most of the activities in a Patriot site would be concentrated around the billeting and control stations, and to and from the control, radar, and firing units. As a result, much of the area in front of the Patriot firing units and on the sides would be subject to minimal disturbance. The resulting pattern of disturbance would be hourglass-shaped with the heaviest potential disturbance located at the entry point spreading out towards the billeting and the control center, narrowing in by the power plant and radar unit, and fanning out again by the launchers.

Mobile Avenger and Sentinel Sites

The six Avenger Batteries consists of one high-mobility multipurpose-wheeled vehicle (HMMWV) with a turret mounted weapon system (Figure 4) and about five soldiers per unit. Equipment is typically limited to an area of only 50 meters square (m^2) or 0.63 acres. While at their deployment sites, the Avenger units attempt to electronically detect and defeat aggressor REDFOR units. This system is utilized for low-level aerial threats and reconnaissance, and plays an integral role in an ADA unit.

The three Sentinel radar systems each consists of two vehicles with a trailer-mounted radar system consisting of an antenna transceiver group mounted on a high-mobility trailer towed by a HMMWV (Figure 5). The unit is typically emplaced and operated by up to six soldiers. The role of the unit is to alert CCC and other ADA teams of hostile and unknown aerial threats and the system links other Patriot, Avenger, and Sentinel units electronically by both voice and electronic data streams.


Joint Red Flag '05 ADA Activities
Figure 3
Patriot Battery Unit
Patriot Site Diagram
1 kilometers
LS = Launching Stations
RS = Radar Station
EPP = Electric Power Plant
ECS = Engagement Control Station
AMG = Antenna Mast Group
T = Tent
No Disturbance
Low to Medium Disturbance
Heavy Disturbance
Maintenance Equipment
15Kw Gen Set
Equipment Not to Scale
Electrical Power Plant
Patriot Launching Station
Antenna Mast Group
Source: U.S. Army, 2004

The Avenger and Sentinel systems would have access 50 meters off along known roads/trails in Caliente West area as needed during the training. These sites will be selected following the SOPs during the actual training. The units will be restricted to the access roads only in desert tortoise habitat areas. Based upon the tactical scenario, weather conditions, terrain, NTTR management restrictions, and required battlefield survivability, these units would move frequently during the proposed ADA activities. By using mobile/transient sites, the Avenger and Sentinel units would be able to move after each live fly proposed ADA activities, allowing them the benefit of locating to a different terrain between proposed ADA activities. These units would have access to portable latrines in the vicinity for proper field sanitation.
Each transient site would be identified by GPS coordinate and a monitoring checklist would be completed. This would enable the environmental monitoring teams to identify the site during the after action review.

Logistic Support Area

In order to support the proposed ADA activities, the Alamo airfield, a dirt landing field located approximately one mile west of the community of Alamo, would be used for a logistics deployment site to stage equipment and replenishments for the field units. All activities at this site would be restricted to the landing site and the perimeter of the area would be clearly identified by flagging or signage. Support vehicles and equipment include approximately 20 to 25 heavy-duty cargo trucks, 2 fuel trucks, 12 to 15 light-duty utility trucks, and 4 to12 generators, depending on mission requirements. Access to and from the airfield would go through the town of Alamo, remain on existing roads, and to the extent possible would only occur during daylight hours. Replenishments and exercise commanders would be sent from the Alamo airfield to the Patriot batteries using an access road east of Alamo as necessary. The LSA would provide for quick and efficient movement of supplies to the field and would limit extensive vehicle travel to NAFB or the Las Vegas or Tonopah Test Range Complexes.

Command and Control Center

The CCC is the operational command center for the proposed ADA activities. This site would act as the fire control center during the exercise and would direct the Patriot, Avenger, and Sentinel units in the field. The CCC would be located at the Patriot 3 site at the Caliente dirt airfield.

Proposed ADA activities Review

At the conclusion of the live-fly portion of the proposed ADA activities and demobilization of the ADA batteries, each ADA site utilized during the proposed ADA activities would be inspected by the 2-43 Battalion Environmental Monitoring Teams and representatives of the BLM. Each site would be photographed and the post-activity site conditions documented in After Action Reviews (AARs) prepared under the direction of the Battalion Maintenance Officer, who provides daily briefs to the Battalion Commander. If any damage, not consistent with the potential impacts identified in the EA, has occurred at a site, the appropriate unit commander would be notified and appropriate actions would be taken to restore the site in consultation with the BLM. Based on the recommendations of the BLM and the Army, the site would be restored as necessary to preclude continued degradation within one year of the exercise.

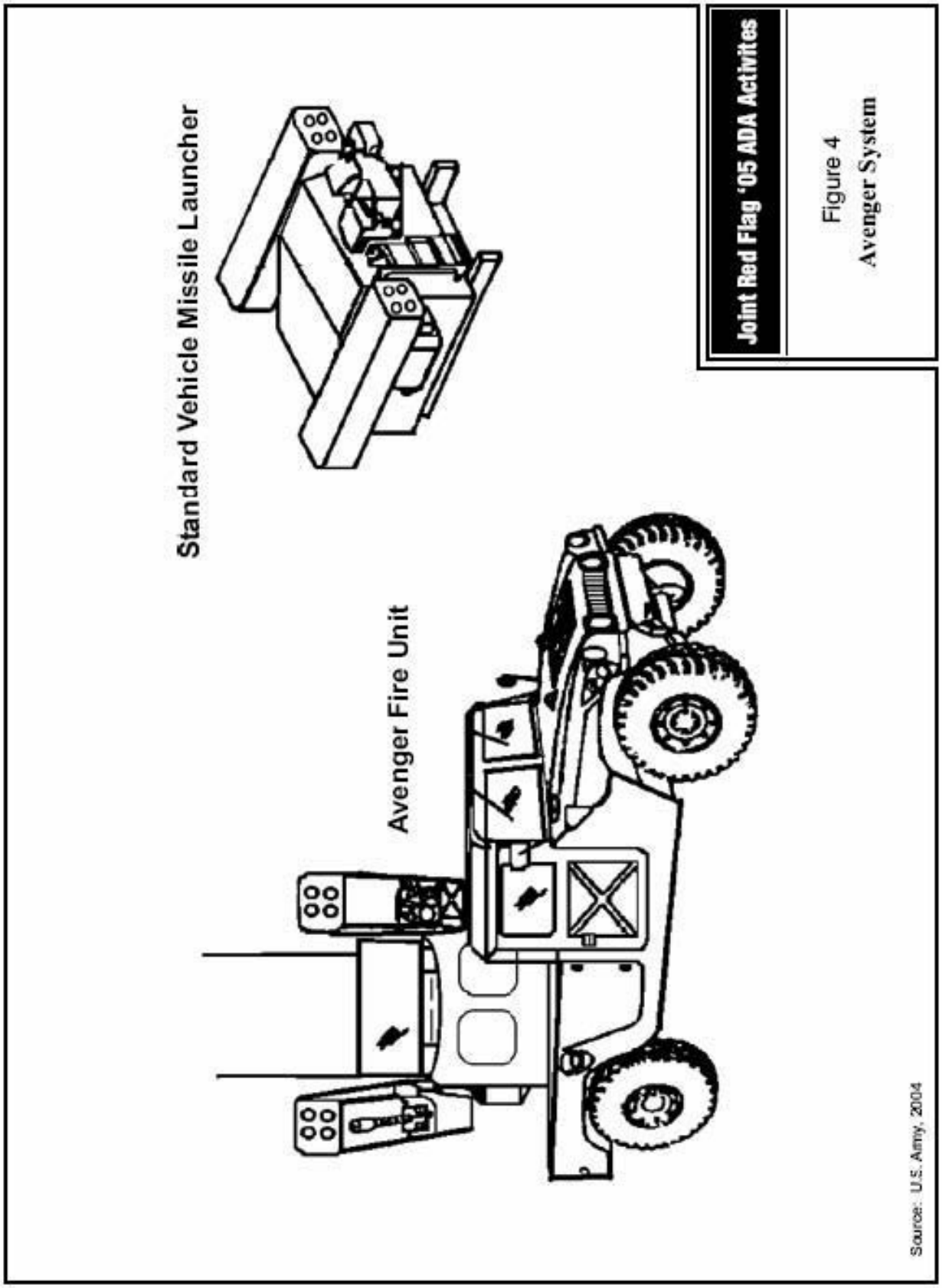


Figure 4
Avenger System

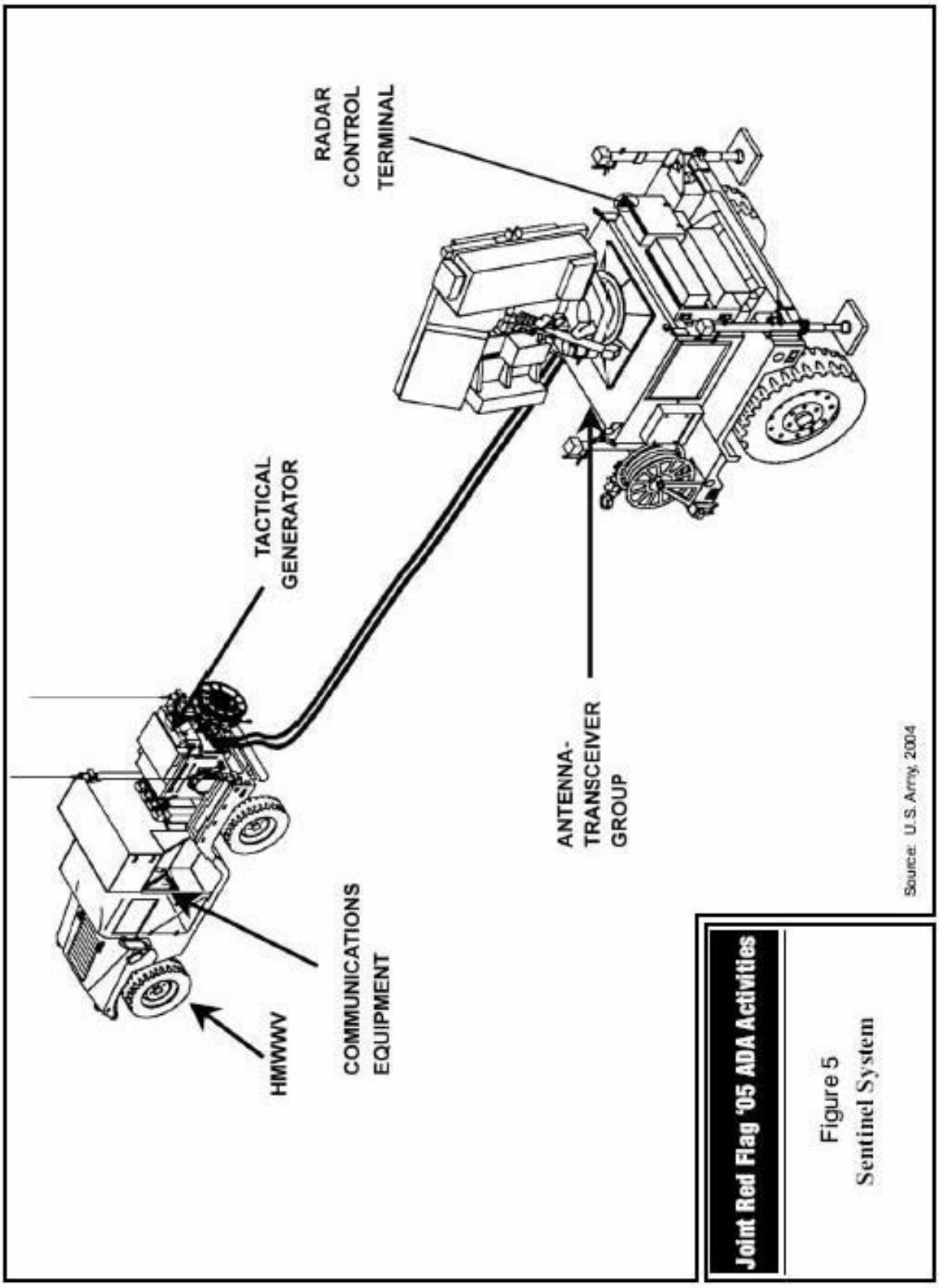


Figure 5
Sentinel System

Standard Operating Procedures

Several mechanisms are incorporated into the proposed ADA activities that would reduce or avoid known potential impacts to sensitive resources. These include environmental criteria identified for the selection of each ADA site, and the Army and NAFB have developed SOPs that have been incorporated into the proposed ADA activities to minimize or avoid potential impacts. The following selection criteria and SOPs have been incorporated into the proposed ADA activities:

- The chain of command is responsible for each Avenger and Patriot unit to ensure safety and environmental requirements/restrictions are being observed. The chain of command will approve each relocation by Avenger units.
- Ground-based units will use global positioning systems (GPS) to ensure they are located within proposed site boundaries. Proposed sites for Patriot Batteries, sensitive species restricted areas, and wilderness areas to avoid will be clearly delineated on maps.
- No digging will occur at field sites. Vegetation will not be cleared at these sites. Outriggers will be installed to stabilize equipment platforms. No fences will be cut.
- The Patriot Battery sites will have a pre- and post-proposed ADA activities inspection for environmental and cultural resources. Before and after photographs will be taken to document site conditions.
- Drip pans will be placed under all parked vehicles to avoid contaminating soils.
- To the extent practicable, gray water will be dispersed over areas with deep soils.
- To the extent feasible, vehicle speeds on unpaved roads shall be limited to no more than 20 miles per hour.
- Personnel shall remain at least a quarter of a mile from any known existing water source.
- ADA sites shall not be used if ponded or flowing water is present.
- Any sites found to have experienced environmental damage requiring restoration will be restored as soon as practicable after the proposed ADA activities. Restoration methods will be determined by BLM.

Existing Conditions

This section describes the existing biological resources that occur in the region of the proposed ADA activities and the site-specific conditions identified at each of the ADA sites. The proposed ADA activities area is located in the transition zone between the northern Mojave Desert and the southern Great Basin. Although a small portion of the Proposed ADA activities area has characteristics of the Mohave Basin, most of the vegetation is more similar to that of the Great Basin. In this region, rainfall totals are often less than 4-inches per year and results in a dry to moderately dry climate with cold winters and hot summers (USAF 1999). The adjacent mountain ranges including the Delamar Mountains, Pahroc and Seamans Ranges receive snow during cold winter storms; however more southern areas receives much of the annual rainfall during the summer months for short but intense periods of time as a result of periodic monsoons. Except in the driest years, climatic conditions generally support perennial flows in the Pahranagat Valley and White River. Although extremely small in total area, riparian and lacustrine communities in this region support large numbers of species including 80 percent of the regions birds (Dobkin 1996).

Vegetation

Plant communities in this region are characterized by Mojave Desert Scrub and Great Basin Desert Scrub biomes (Brown, 1994). For most of the region, the availability of water or soil moisture is the critical factor that determines the distribution of vegetation types and associated wildlife species. A description of the dominant plant communities located in the region is described below.

Mojave Desert Scrub Biome

Mojave Desert Scrub communities occur to a limited extent in the proposed ADA activities area and are primarily located east of the community of Alamo near Eight Mile Valley. This region is the most northern extent of the Mojave Basin biogeographic province and is dominated by creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), range ratany (*Krameria erecta*), cheesebush (*Hymenoclea salsola*), and spiny menodora (*Menodora spinescens*). Four-wing saltbrush (*Atriplex canescens*), joint-fir (*Ephedra nevadensis*), and Joshua tree (*Yucca brevifolia*) are other common elements observed in these communities. Although not the dominant vegetative cover, Joshua trees formed a conspicuous element at several locations in the proposed ADA activities area. Cacti were also well represented region wide and include silver cholla (*Opuntia echinocarpa*), old man cactus (*O. erinacea*), and beavertail (*O. basilaris*). Strawberry hedgehog cactus (*Echinocereus engelmannii*) is also present but to a limited extent.

Herbaceous annual species identified in the proposed ADA activities area included desert mallow (*Sphaeralcea ambigua*), desert trumpet (*Eriogonum inflatum*), Mojave buckwheat (*E. fasciculatum*), Mojave aster (*Xylorhiza tortifolia*), blue flax (*Linum perenne*), and princes plume (*Stanleya pinnata*). The native perennial grasses Indian rice grass (*Oryzopsis hymenoides*), big galletta (*Hilaria rigida*), and fluffgrass (*Erioneuron pulchellum*) were present. Non-native grasses and invasive herbaceous plants occur to a limited extent in most of the proposed ADA activities area and include cheatgrass (*Bromus tectorum*), downy brome (*B.tectorum*), and red brome (*B. madritensis ssp. rubens*). Other invasive species including halogeton (*Halogeton glomeratus*), Russian thistle (*Salsola tragus*), and tansy mustard (*Descurania sp.*) are common elements along disturbed roadsides and heavily grazed areas.

Great Basin Desert Scrub

Great Basin Desert Scrub evolved from both cold-temperate and warm temperate vegetation and is characterized by communities dominated by sagebrush (*Artemisia* spp.), shadescale (*Atriplex confertifolia*), or winterfat (*Krascheninnikovia lanata*) (Brown, 1994). Blackbrush (*Coleogyne ramosissima*), greasewood (*Sarcobatus vermiculatus*), and rabbitbrush (*Chrysothamnus* spp.) are also common and are often co-dominant or present in many Great Basin plant communities. These plant communities are composed of small, dense, aromatic shrubs and occur to some extent at several locations in the proposed ADA activities area. In this region, winter temperatures are too low to support plants typical of the warmer deserts of the Southwest, such as creosote bush and few cacti occur (USAF, 2001).

Vegetation located on the lower elevations of the valley and basin floors including the Proposed ADA activities area at Dry Lake are characterized by monocultures of halophytic (salt-tolerant) shrubs including spiny hopsage (*Grayia spinosa*), four-wing saltbush, and winterfat. Where soils are

especially alkaline and clay-rich, as on the margins of dry lake beds (e.g. Dry Lake Valley), saltbush species including four-wing saltbush, and shadscale dominate the vegetation. Saltbush communities, especially near playas, may consist exclusively of these species. Other common species observed in this area include rubber rabbitbrush (*C. nauseosus*), [sticky rabbitbrush (*C. paniculatus*) or sticky-leaved rabbitbrush (*C. viscidiflorus*)], and snakeweed (*Gutierrezia sarothrae*). Because of the timing of the surveys few herbaceous species were observed but included big galletta grass, Indian rice grass, Utah penstemon (*Penstemon utahensis*) and bristly gilia (*Langloisia setosissima*). Other less common species included scarlet gaura (*Gaura coccinea*), basket bush (*Rhus trilobata*), and black sage (*A. nova*). Spiny chorizanthe (*Chorizanthe rigida*), golden head (*Acamptopappus shockleyi*), and the invasive Russian thistle were also present and in some areas formed dense carpets along the basin floors.

Intermediate elevation slopes located along the periphery of the dry lakes are dominated by Great Basin mixed desert scrub characterized by rabbitbrush, hopsage, winterfat, and blackbrush. In some areas, range ratnay and white bursage co-dominate with four-wing saltbush. Near Highway 93 at the Pahroc summit pass, Mojave Desert Scrub intergrades with Basin communities and supports small components of Joshua tree, banana yucca (*Yucca baccata*), and beavertail cactus. Desert needle grass (*Stipa speciosa*), Indian rice grass, big galletta, and fluff grass occur in open spaces between the shrubs.

Non-woody range weeds like halogeton, Russian thistle, and non-native grasses, including cheatgrass and red brome are locally abundant on disturbed sites and commonly occur in this area (USAF 2001).

To verify existing conditions at each of the proposed ADA sites, the USACE contractor conducted biological surveys between 15-17 October 2004 and 21-22 December 2004. Biological resources on each site were noted and vegetation maps were completed for each of the proposed sites (Appendix B). Due to the timing of the surveys (October and December 2004) short-lived annual species dependent on summer rainfall could not be fully detected. Dominant plant communities and cover types associated with Great Basin and Mojave Desert Scrub biomes that occur at the proposed ADA sites include: Blackbrush, Saltbush, Mojave mixed scrub, Playa, Rabbitbrush, Salt desert scrub, Urban, Winterfat, Basin big sagebrush.

The proposed ADA activities area also contains sections of highly disturbed rangeland which has been subject to extensive grazing by domestic cattle (*Bos taurus*) and wild horses (*Equus caballus*). Similarly, some areas contain little or no vegetation, have been previously graded, or have been subject to periodic disturbance from off-road vehicles and recreational use. At two locations, the proposed sites would be located at existing dirt airfields.

Table 3, identifies the existing biological conditions that occur on each of the proposed ADA sites.

Table 3, Site Description and Land Cover Characteristics at Proposed ADA Sites.

ADA Site	Location	Land Type	Land Cover Characteristics
LSA	Alamo Airfield ca. 1 mile west of the community of Alamo	Barren, dirt airfield	Site would be located on the improved dirt airfield. Existing runway is approximately 1 mile long and 0.1 mile in width. Surrounding habitat is characterized as Mojave scrub dominated by creosote bush in association with Mormon tea, Joshua tree, snakeweed, and banana yucca.
PAT 1	Delamar Valley near Delamar Lake	Playa	Barren. Vegetation limited to isolated populations of greasewood and hopsage located near the dirt access road. Invasive species such as Russian thistle and halogeton are present on portions of this site but occur primarily on disturbed road edges.
PAT 3/CCC	Delamar Valley ca. 1 mile south of Highway 93	Disturbed grassland, dirt airfield	Located at south end of dirt airstrip. Heavy disturbed from periodic mowing and grazing. Dominant species include desert needle grass and rubber rabbitbrush. Indian rice grass, big galletta grass, and Russian thistle common.
PAT 4	Area west of Pahroc summit pass	Blackbrush	Scrubland dominated by blackbrush, white bursage, four-wind saltbush, and range ratany. No recent evidence of grazing. Joshua tree, creosote bush, and elements of big sage brush also present. Beavertail, silver cholla, and old man cactus present. Small population of basket bush located on southern section.
PAT 101	Delamar Valley ca. 8 miles north of Delamar Lake	Disturbed, barren feed lot area	Area located near BLM feedlot reservoir. Many areas lack vegetation and consist of hard packed soils. Russian thistle dominates vegetative component at the site.
PAT 102	Delamar Valley ca. 3 miles south of highway 93	Disturbed rabbitbrush and playa	Area located near BLM feedlot reservoir. Many areas lack vegetation. Dominant vegetation includes disturbed rabbitbrush community, bursage, Indian rice grass, and snakeweed. Russian thistle common. Joshua trees and winterfat present to a limited extent.
PAT 103	Dry Lake Valley ca. 9 miles north of Highway 93	Disturbed Salt Desert Scrub	Evidence of historic grazing. Site dominated by Russian thistle, rabbitbrush, and cheat grass. Other species include mallow, Indian rice grass, and big galletta.
PAT 104	Dry Lake Valley ca. 20 miles north of Highway 93	Disturbed grassland	Disturbed grassland with heavy component of Russian thistle. Indian rice grass and big galletta are also present.
PAT 104A	Dry Lake Valley ca. 20 miles north of Highway 93	Disturbed grassland	Grassland dominated by cheatgrass, Indian rice grass, and big galletta. Russian thistle common. Other species includes snakeweed, Mormon tea, and winterfat.

Noxious Weeds

An inventory of noxious weeds has been conducted for sections of the proposed ADA activity area. The BLM identified three locations in the Dry Lake Valley where populations of noxious weeds are present. These areas would be identified and avoided during the proposed ADA activities. However, no plants listed as Noxious by the State of Nevada or BLM were identified at any of the proposed ADA sites. Invasive non-native species such as halogeton, Russian thistle, and brome grasses are common in the region and at some ADA locations.

Wildlife

Reconnaissance surveys were conducted in the proposed ADA activity areas from October 15-17, 2004 and December 21-22, 2004. Few wildlife species were observed during these surveys and with the exception of cattle and wild horses. Common mammal species observed during the survey included desert cottontail rabbit (*Sylvilagus audubonii*) and black-tailed jackrabbits (*Lepus californicus*). Small rodent burrows were common and were present to some degree at most of the proposed ADA sites. Near Dry Lake Valley and Coal Valley, several sets of tracks were located in the dry playa and indicate the general area supports populations of mule deer (*Odocoileus hemionus*) and coyote (*Canis latrans*). Large mammals were not observed in the Proposed ADA activities area.

Other common species expected to occur in the general proposed ADA activities area include badger (*Taxidea taxus*), kangaroo rats (*Dipodmys* ssp.), pronghorn antelope (*Antilocapra americana*), and at higher elevations Desert bighorn sheep (*Ovis canadensis*). Populations of bighorn sheep are known to occur in the adjacent Pahranagat Range, the Sheep Range, and the Delmar Mountains, but are not expected to occur in or adjacent to the proposed ADA sites (USAF 2001).

Several common bird species were observed within or adjacent to the proposed ADA activities area including Gambel's quail (*Callipepla gambelii*) observed near an active cattle trough, common ravens *(Corvus corax*), mourning dove (*Zenaida macroura*), and Horned Lark (*Eremophila alpestris*). A single red-tailed hawk (*Buteo jamaicensis*) was observed near Delamar Valley.

Although a number of reptile species may occur within the proposed ADA activities area, only Great Basin rattlesnake (*Crotalus lutosus*), gopher snake (*Pituophis melanoleucus*), side-blotched lizards (*Uta stansburiana*), and western whiptails (*Cnemidophorus tigris*) were observed during the surveys.

Wild Horses and Burros

A small population of feral horses (less than 20 animals) was observed ranging in the northern section of the proposed ADA activities area in Coal Valley. Wild horses and burros (*E. assinus*) were released by ranchers, miners, and others over the past 100 years, and are know common rangeland species in the western United States and particularly in Nevada (Slade and Godfrey, 1982). Wild horses and burros are protected under Public Law 92-195, the Wild Free-Roaming Horse, and Burro Act of 1971. Under this act, the BLM and USFS are charged with managing and protecting these animals.

Migratory Birds

The Pahranagat Valley and associated upland areas provide important habitat for a variety of migratory birds utilizing the western flyway. Riparian and scrub communities provide shade, resting areas, protection from predators, and foraging, nesting and breeding habitat. With the exception of a few non-native species, all migratory birds are protected under the Migratory Bird Act. Several federally protected migrants have been documented in the general region including the southwestern willow flycatcher. Other migrant species forage and rest in large numbers I the valley's riparian vegetation, including Say's phoebe (Sayornis saya), cactus wren (Campylorhynchus brunneicapillus), and horned lark (Eremophila alpestris). The BLM (IM NV-040-2001-02) provides direction regarding activities that may affect migratory birds and has identified a "no-activity" period between May 1 to July 15 each year. The proposed ADA activities do not occur during the identified "no-activity" period.

Traffic

According to the BLM, there is occasional vehicle traffic along the Alamo Canyon Road between the City of Alamo and the Delamar Valley area. This traffic includes vehicles for fiber optic line maintenance and oil/mineral companies. The proposed ADA activities could have a maximum of fifteen vehicles along Alamo Canyon Road between one to three times a day. These vehicle would use Alamo Canyon Road at random times and would not all be on the road at the same time. This would be limited to the HHMWV vehicles of the Avenger, Sentinel, and command units.

Sensitive Species

The U.S. Fish and Wildlife Service (USFWS) in a letter dated January 31, 2005 provided a list of federally endangered, threatened, and proposed species that may occur in the proposed ADA activities area (see Table 1).

Table 1: Threatened, Endangered, and Candidate species in the proposed ADA activities area.

Common Name	Scientific Name	Status	Critical Habitat
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered	Yes
Bald Eagle	*Haliaeetus leucocephalus*	Threatened	
Desert tortoise	*Gopherus agassizi*	Threatened	Yes
White River Springfish	*Crenichthys baileyi baileyi*	Endangered	
Hiko White River Springfish	*Crenichthys baileyi grandis*	Endangered	
Pahranagat Roundtail Chub	*Gila robusta jordani*	Endangered	
Big Spring Spinedace	*Lepidomeda mollispinis pratensis*	Endangered	
Western Yellow-billed cuckoo	*Coccyzus americanus occidentalis*	Candidate	

Standard Operating Procedures for the proposed ADA activities requires that ground-based units remain at least a quarter mile away from any existing or known water sources. Therefore, cottonwood, willows, walnut, mesquite, and other riparian vegetation preferred by the southwestern willow flycatcher, bald eagle, and western yellow-billed cuckoo (Sogge et al. 1997, Ehrlich et al. 1988) would not be impacted. Potential wintering habitat for bald eagles occurs in Pahranagat Valley and the Pahranagat National Wildlife Refuge. However, forested habitats near bodies of water preferred by

bald eagles do not occur within two miles of the proposed ADA activities occupation areas. The riverine pools used by white river springfish, Hiko white river springfish, Pahranagat roundtail chub, and big spring spinedace also will not be impacted. Therefore, the desert tortoise is the only sensitive species that will be discussed in further detail.

Desert Tortoise

The desert tortoise was federally listed as threatened on August 20, 1980 (45 FR 55654). On April 2, 1990, the USFWS determined the Mojave population of the desert tortoise to be threatened (55 FR 12178). On February 8, 1994, the USFWS designated approximately 6.4 million acres of critical habitat for the Mojave population of the desert tortoise (59 FR 45748), which became effective on March 10, 1994. Approximately 1.2 million acres were designated as critical habitat in Nevada. On June 28, 1994, the USFWS approved the *Final Recovery Plan for the Desert Tortoise (Mojave Population)* (USFWS 1994). The State of Nevada has listed the desert tortoise as a fully protected species and has designated the desert tortoise as its official state reptile.

Reasons for listing the tortoise included loss of habitat from construction, agriculture, grazing, off-road vehicles use, illegal collection, upper respiratory tract disease, and predation on juvenile desert tortoises by common ravens. Fire is an increasingly important threat to desert tortoise habitat. Over 500,000 acres of desert lands burned in the Mojave Desert in the 1980s (USFWS 1994).

The desert tortoise historically ranged throughout the deserts of the southwestern United States and northern Mexico. In Nevada, the native range of this species is generally restricted to Clark County and those portions of Nye, Lincoln, and extreme southern Esmeralda counties, south of the 38th parallel and below approximately 4,000 feet (1,330 meters) elevation.

The desert tortoise has the potential to occur at lower elevations east of Alamo near the Hiko Range. This area supports Mojave Desert scrub habitat at elevations generally below 4,000 feet and several sightings of this species have been recorded in the general area in 2003 (NDOW 2004)

The desert tortoise occupies a wide variety of desert habitats across its range. The Mojave desert tortoise is associated with creosote bush (*Larrea tridentata*), burrow-bush (*Ambrosia dumosa*), creosote bush-Joshua tree (*Yucca brevifolia*), and shadscale (*Atriplex confertifolia*) vegetation types. The tortoise prefers sandy and gravelly soils of desert valleys and alluvial fans, and typically occur on flats, valleys, bajadas, and rolling hills generally 2,000 to 3,500 feet in elevation. This species normally excavates a burrow under bushes, overhanging soil or rock formations, or digs into soil in the open. Tortoises typically avoid plateaus, playas, sand dunes, steep slopes (> 20 percent), and areas with obstacles, such as dense vegetation and rocky terrain that would inhibit movement. Friable soil is important for digging burrows.

Desert tortoises in the Mojave Desert are primarily active between May and June, with a secondary activity period from September through October; however, tortoises, particularly small tortoises, may be active during any month of the year. Occurrence of monsoonal rains in late summer may result in increased tortoise activity. During inactive periods, tortoises hibernate, estivate, or rest in subterranean burrows or caliche caves, spending as much as 98 percent of their time underground (USFWS 1994). During active periods, they usually spend nights and the hotter portion of the day in their burrow.

Tortoises construct and maintain a series of single-opening burrows, which may average from 7 to 12 burrows at a given time (USFWS 1994).

Desert tortoises are herbivores feeding on annual forbs, herbs, cacti, and grasses (Stebbins 1985; Zeiner et al. 1988). Forage species selected by tortoises in the Mojave Desert include: *Astragalus didymocarpus, A. layneae, Camissonia boothii, Euphorbia albomarginatus, Lotus humistratus,* and *Mirabilis bigelovii (*Jennings 1993). In drought years, the ability of tortoises to drink while surface water is available following rains may be crucial for tortoise survival. During droughts, tortoises forage over larger areas, increasing the likelihood of encounters with sources of injury or mortality including humans and other predators.

Tortoises may require 20 years to reach sexual maturity (Turner *et al*. 1984). Copulation begins in late March or early April; 1-15 eggs laid in late May to July, hatch from mid-August to mid-September (Stebbins 1985; Zeiner et al. 1988). Multiple clutches (2 or rarely 3) occur in favorable years (Stebbins 1985). Failure of rainfall and consequent scarcity of plants may result in reproductive failure (Zeiner et al. 1988).

Tortoise activities are primarily concentrated in core areas or home ranges. Home ranges of tortoises overlap because they do not defend a specific or exclusive area. Home range sizes can range from 10 to 450 acres and vary with sex, age, season, and density or availability of resources (USFWS 1994a). Females have long-term home ranges that are approximately half that of the average male, which range from 25 to 200 acres (Berry 1986). Over its lifetime, each desert tortoise may require more than 1.5 square miles of habitat and make forays of more than 7 miles at a time (Berry 1986).

Desert Tortoise Survey

On February 2-3, 2005, biologists from Southern Nevada Environmental Inc. conducted a biological surveys along portions of the airport access road and runway at the Alamo Airport in Alamo, NV as well as triangular transects for desert tortoise along the Alamo Canyon Road.

Survey Method

The survey area was divided into three areas: 1) the airport runway access road, which consisted of all land within 200 yards to the north and south sides of the access road and a proximity circle of 200 yards from the southern endpoint of the runway to the west; 2) the runway, which consisted of 500 yards of the south end of the runway; and 3) Alamo Canyon Road where four triangular transects were completed along the two miles located on the east side of US Hwy 93. Surveys of the Alamo Canyon road were completed using the best professional judgment of the tortoise biologists. These areas will be referred to as Sites 1-3 respectively.

The proposed ADA activity sites were identified using maps and descriptions provided by Aspen Environmental Group Inc, qualified desert tortoise biologists were dispatched to the project sites. The maps and descriptions were based on consultation with the USFWS and the U.S. Army Corps of Engineers. Endpoints of each proposed ADA activity were entered into a Garmin Global Positioning Unit in Nevada Stateplane, North American Dataum 1983 projection. A complete survey for desert tortoise was conducted on each site and the surrounding area using 100% coverage techniques.

Included in the survey was a search for all desert tortoise sign including scat, courtship rings, burrows, pallets, and tracks. Transect spacing was approximately 30 feet (10m) for the entire project area. All wildlife sign was noted especially that for desert tortoise in and around the project area. Habitat and general vegetation community findings were noted as were general soil and topographic characteristics. Photographs were taken at each site (these will be included when I receive them).

Survey Results

The following, indicates by site the findings of the desert tortoise survey for the proposed ADA activity area. Maps of the survey result are show in figures 6 and 7.

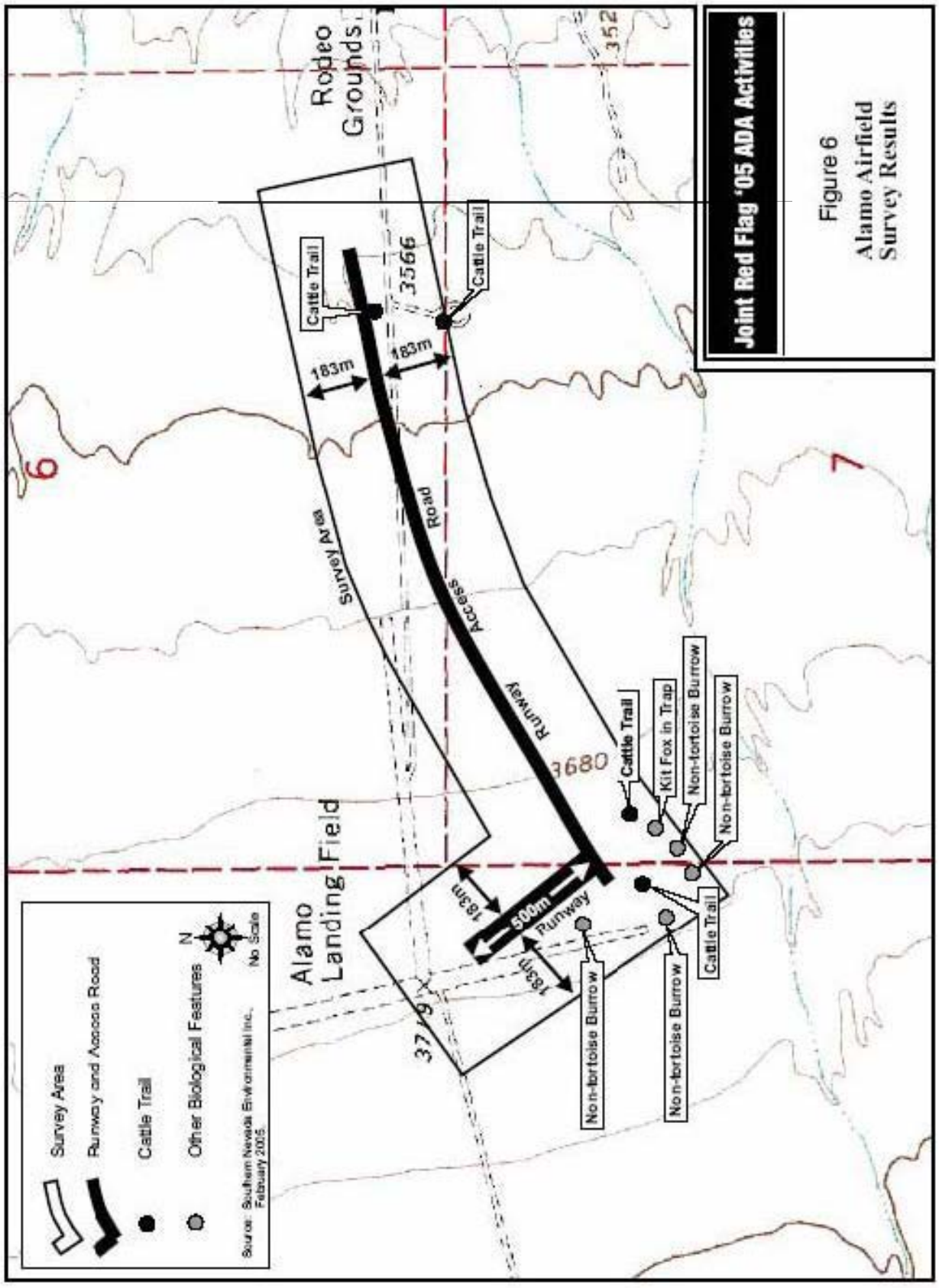
Site 1 (Alamo Airfield Access Road) - No desert tortoise was seen, nor was desert tortoise sign identified at this site. General habitat characteristics are low for desert tortoise due to disturbance in the area from human as well as cattle. Elevation is at the high end of desert tortoise preferences. Approximately 4-5 common ravens were seen at this site.

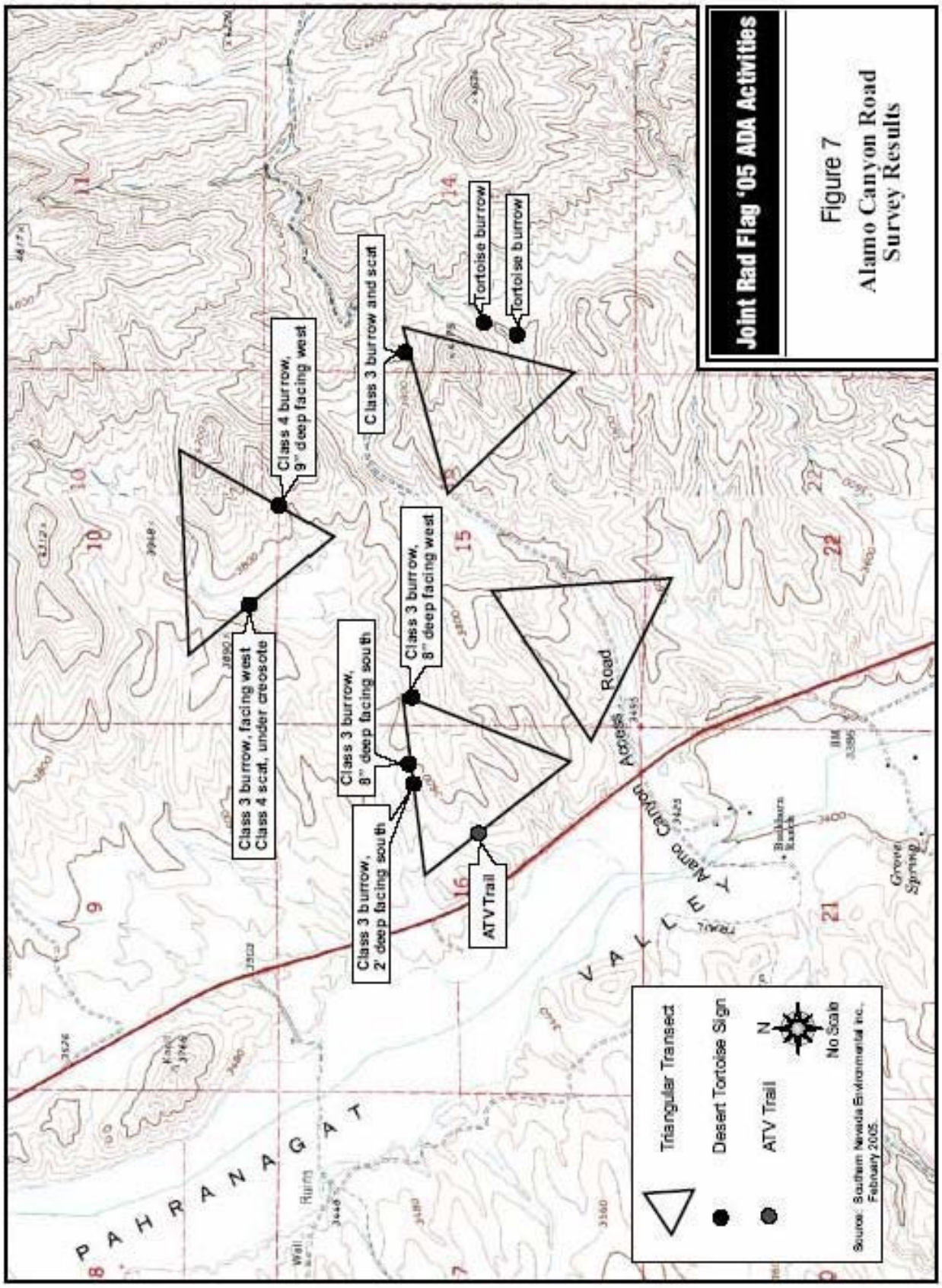
Site 2 (Airfield Runway) – No desert tortoise was seen, nor was desert tortoise sign identified at this site. General habitat characteristics are low for desert tortoise due to disturbance in the area from human as well as cattle. Elevation is at the high end of desert tortoise preferences. A kit fox trapped in leg trap was found in a burrow entrance along the wash south of the runway.

Site 3 (Alamo Canyon Road) –In triangle 1, three desert tortoise Class 3 burrows were sited. In triangle 2, one desert tortoise Class 3 burrow was found and one desert tortoise Class 4 burrow was seen. In triangle 3, five desert tortoises Class 3 burrows were found, but no desert tortoise were seen. One Class 4 scat was found. General habitat characteristics are good for desert tortoise although elevation is high. ATV disturbance and a large disturbance due to cattle were seen at this site.

Other Desert Tortoise sightings

Several sightings of desert tortoise have been recorded in the quads Alamo SE and Alamo. This species was also reported to occur in the Delamar Valley (NDOW 2004c). A single, possible desert tortoise, burrow was noted in a drainage bank near the Richardville Cemetery, just north of Alamo. Four well-bleached fragments of an old tortoise carcass were found approximately adjacent to Highway 93 approximately three miles north of the community of Alamo (LCTS, 2004). In the same general vicinity, a single fragment of a more recent tortoise carcass (partial scute still adhering) was noted in the ditch alongside US 93 (LCTS, 2004).


Joint Red Flag '05 ADA Activities
Figure 6
Alamo Airfield
Survey Results
Rodeo Grounds
Alamo Landing Field
Survey Area
Runway and Access Road
Cattle Trail
Other Biological Features
N
No Scale
Source: Southern Nevada Environmental Inc., February 2005
Cattle Trail
Cattle Trail
183m
183m
Survey Area
Road
Access
Runway
3566
3680
Cattle Trail
Kit Fox in Trap
Non-tortoise Burrow
Non-tortoise Burrow
183m
500m
Runway
183m
Non-tortoise Burrow
Non-tortoise Burrow
Cattle Trail
6
7


Joint Red Flag '05 ADA Activities
Figure 7
Alamo Canyon Road
Survey Results
Class 4 burrow, 9" deep facing west
Class 3 burrow and scat
Tortoise burrow
Tortoise burrow
Class 3 burrow, facing west
Class 4 scat, under creosote
Class 3 burrow, 8" deep facing south
Class 3 burrow, 2' deep facing south
Class 3 burrow, 8" deep facing west
ATV Trail
Road
Alamo Canyon
Access
Grave Spring
Ruins
Well
PAHRANAGAT
Triangular Transect
Desert Tortoise Sign
ATV Trail
N
No Scale
Source: Southern Nevada Environmental Inc., February 2005

EFFECTS OF THE PROPOSED ACTION

For Federally listed or species proposed for listing, direct effects are those effects which would lead to the "taking" of an individual of those species analyzed in this document and as defined in Section 9 and/or Section 10 of the Endangered Species Act of 1974, as amended (Act). Section 9 of the Act prohibits (i.e. to harass, harm, pursue, hunt, wound, kill, etc.) of listed species of fish, wildlife, and plants without special exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or shelter. "Harass" is further defined as actions that create the likelihood of injury to listed species to an extent as significantly disrupt normal behavior patterns which include, but not limited to, breeding, feeding, and shelter.

Indirect effects are defined as those effects that are caused by the proposed action and are later in time, but still reasonably certain to occur (50 CFR 402.02).

Cumulative effects are those, which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or program undertake such actions (40 CFR 1508.0).

Direct Effects

The proposed ADA activity areas that may have direct impacts to the desert tortoise is the Alamo Canyon Road and potentially the LSA. Tortoises may be killed or injured by vehicles, and their foraging, breeding, or sheltering behavior altered because of noise and ground vibration produced by heavy equipment. Tortoises and their burrows may be crushed or destroyed by vehicles that stray into vegetated areas. Tortoises may wander into activity areas and occur in harm's way. Because desert tortoises occur at the Alamo Canyon Road and have habitat (even though habitat characteristics are low) at the Alamo airfield access road and the airfield runway, SOPs have been incorporated into the proposed ADA activity. With the SOPs in place, the impacts to desert tortoise are expected to be low or insignificant.

Noise levels produced by vehicles may alter tortoise behavior (potentially affecting foraging and other activities) or cause hearing loss, but these effects are difficult to assess and are not well documented. Noise has the potential to disrupt communication and mask the sounds of approaching predators (USFWS 1994). Bowles *et al*. (1997) found that no significant temporary threshold shift, or temporary change in auditory sensitivity, was detected even in the most acoustically sensitive tortoises after a worse case scenario exposure to subsonic aircraft noise. Some tortoises did, however, prove to have relatively sensitive hearing at summer temperatures.

Tortoises use depressions as drinking sites including depressions in roadways. Vehicular activity on unpaved roads following rains may preclude tortoises from drinking water, which may be available for only brief periods. Tortoises that move or occur in the paths of vehicles may be killed or injured (Bury 1978, Luckenbach 1975, Nicholson 1978).

Indirect Effects

The Proposed ADA activities could indirectly affect the desert tortoise by activities involving the use of hazardous fluids such as oil and gas. Human activities can indirect effect desert tortoise habitat by attracting predators such as the common raven, kit fox, and coyote by trash and litter remains (Berry 1985; BLM 1990; Boarman 2002). With the SOPs in place, indirect effects would be minimized.

Cumulative Effects

The proposed ADA activities would not result in significant impacts to biological resources. Therefore, the proposed ADA activities would not contribute to cumulatively significant impacts to biological resources in the region.

MANAGEMENT RECOMMENDATIONS

The following measures are appropriate to minimize the potential effects of the Joint Red Flag '05 exercise on the desert tortoise.

1. Before conducting proposed ADA activities related activities, the LSA site shall be cleared of desert tortoises by a qualified tortoise biologist.
2. A qualified biologist would periodically inspect the LSA site during the Proposed ADA activities to ensure desert tortoise has not moved onto the site.

3. Desert tortoise burrows found along Alamo Canyon Road will be avoided. Vehicles in this area will be required to remain on the road and travel at 20 mph.

4. The Army/USAF shall present a tortoise-education program to all personnel that may encounter desert tortoise during the exercise. This program shall be presented by an authorized tortoise biologist for those projects with the greatest potential impacts to desert tortoises. A video or fact sheet, as approved by the USFWS, may be presented or provided in lieu of a presentation for those projects with low potential impacts.

5. The program will include information on the range and distribution of the species in the action area, life history of the desert tortoise, legal protection for desert tortoises, penalties for violations of Federal and State laws, general tortoise-activity patterns, reporting requirements, measures to protect tortoises, terms and conditions of this biological opinion, and personal measures employees can take to promote the conservation of desert tortoises. The definition of "take" will also be explained. Specific and detailed instructions will be provided as part of the program, on the proper techniques to capture and move tortoises, which appear onsite, in accordance with USFWS-approved protocol. Currently, the USFWS-approved protocol is Desert Tortoise Council 1994, revised 1999.
6. A field contact representative shall be designated to ensure compliance with the minimization measures.

7. If desert tortoise or their sign are observed the observation shall be reported to the designated field contact representative.

8. Activities that may endanger a tortoise will cease if a tortoise is found in harms way as a result of the activity. Project activities will resume after the authorized biologist removes the tortoise from danger, the activity will avoid the tortoise, or after the tortoise has moved to a safe area.

9. A litter-control program shall be implemented to minimize predation on tortoises by subsidized predators such as ravens, which could be drawn to the project by trash. This program will include the use of covered, predator-proof trash receptacles and proper disposal of trash in a designated solid waste disposal facility.

10. A speed limit of 20 miles per hour shall be required for all vehicles within desert tortoise habitat.

11. Within desert tortoise habitat, all vehicular activity shall be restricted to existing roads and previously disturbed areas.

12. USFWS must approve the selected consulting firm/biologist to be used to implement the terms and conditions of this biological opinion. Any biologist and/or firm not previously approved must submit a curriculum vitae and be approved by USFWS before being authorized to represent the Army/USAF in meeting compliance with the terms and conditions of this biological opinion. Other personnel may assist with implementing terms and conditions that involve tortoise handling, monitoring, or surveys, only under direct field supervision by the authorized biologist.

13. In accordance with *Procedures for Endangered Species Act Compliance for the Mojave Desert Tortoise* (USFWS 1992), an authorized desert tortoise biologist should possess a bachelor's degree in biology, ecology, wildlife biology, herpetology, or closely related fields. The authorized biologist must have demonstrated prior field experience using accepted resource agency techniques to survey for desert tortoises and tortoise sign, which should include a minimum of 60 days field experience. All authorized biologists shall comply with the USFWS-approved handling protocol (Desert Tortoise Council 1994, revised 1999) prior to conducting tasks in association with terms and conditions of this biological opinion. In addition, the authorized biologist shall have the ability to recognize tortoise sign and accurately record survey results.

14. Tortoises found in harms way shall be captured and relocated to undisturbed desert within 2 miles from the site found by an authorized desert tortoise biologist according to current approved protocol. Tortoises shall be deliberately moved solely for moving them out of harms way. Tortoises and nests found shall be relocated by an authorized tortoise biologist. Burrows containing tortoises or nests will be excavated by hand, with hand tools, to allow removal of the tortoise or eggs. Tortoises and burrows will only be relocated to federally managed lands. All handling of desert tortoises and their eggs, and nest and burrow excavation and construction shall be performed in accordance with USFWS-approved protocol, found in *Guidelines for Handling Desert Tortoises during Construction Projects* (Desert Tortoise Council, 1994, revised 1999).

15. Tortoises that are moved offsite and released into undisturbed habitat on public land must be placed in the shade of a shrub, in a natural unoccupied burrow similar to the hibernaculum in which it was found, or in an artificially constructed burrow, depending upon the time of year and ambient temperatures.

CONCLUSION

Based on the above discussion, it is determined that the proposed ADA activities would have "*No Effect*" on the southwestern willow flycatcher, bald eagle, western yellow-billed cuckoo, white river springfish, Hiko white river springfish, Pahranagat roundtail chub, and big spring spinedace and their associated habitats. The proposed ADA activities "*May Effect"* the desert tortoise or their habitat.

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APPENDIX E.

MONITOR CHECKLIST

JOINT RED FLAG '05 MONITOR CHECKLIST

1. _____
ORGANIZATION

2. _____
SITE LOCATION

3. _____
GRID COORDINATES
Differentially Corrected?

_____ Yes _____ No

4. _____
DATE

5. _____
UNIT COMMANDER PHONE

6. CIRCLE QUADRANT IN USE

NW	NE
SW	SE

YES	NO	N/A	
[ ]	[ ]	[ ]	**IS UNIT SET UP IN ASSIGNED QUADRANT?**
			HOW CONFIRMED? _____
[ ]	[ ]	[ ]	**DRIP PANS IN PLACE?**
[ ]	[ ]	[ ]	**DRUMS LABELED?**
[ ]	[ ]	[ ]	**BIVOUAC AREAS POLICED?**
[ ]	[ ]	[ ]	**LINERS UNDER FUEL CANS?**
[ ]	[ ]	[ ]	**MKT SET UP PROPERLY FOR REFUELING?**
[ ]	[ ]	[ ]	**GENERATOR FUEL CANS PROPERLY SET UP?**
[ ]	[ ]	[ ]	**DOES PONDED WATER COVER ADA SITE?**
[ ]	[ ]	[ ]	**IS SITE IN KNOWN TORTOISE HABITAT?**
[ ]	[ ]	[ ]	**HAS SITE BEEN CLEARED BY EM TEAM?**
[ ]	[ ]	[ ]	**CHECK FOR WILDLIFE UNDER VEHICLES?**
[ ]	[ ]	[ ]	**HAS CREW RECEIVED ENV. TRAINING?**

COMMENTS: _____

_____

_____

_____

_____

NAME OF INSPECTOR: _____

RANK: _____

TIME: _____